SLV-L49/L52/L59/L69HF/L72HF/L79HF/L89HF/X55/X66HF
RMT-V267/V268

SERVICE MANUAL

Mexican Model
SLV-L49/L69HF/L89HF/X55/X66HF

Panama Model
Ecuador Model
Colombia Model
SLV-L52/L72HF

Bolivia Model
Peru Model
Chilean Model
Venezuelan Model
SLV-L59/L79HF/L89HF

Puerto Rico Model
SLV-L59/L79HF

Photo: SLV-L89HF
RMT-V267

VHS

S MECHANISM

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT Ⅵ for MECHANICAL ADJUSTMENTS. (9-921-647-11)

SPECIFICATIONS

System

Format	VHS NTSC standard
Video recording system	Rotary head helical scanning FM system
Video heads	Double azimuth four heads
Video signal	NTSC color, EIA standards
Tape speed	SP : 33.35 mm/s EP : 11.11 mm/s LP : 16.67 mm/s, Playback only
Maximum recording/playback time	9hrs. in EP mode (with T-180 tape)
Fast-forward and rewind time	Approx. 3 min. (with T-120 tape)

Tuner section

Channel coverage	VHF 2 to 13 UHF 14 to 69 CATV A-8 to A-1, A to W, W+1 to W+84
Antenna	75 Ω antenna terminal for VHF/UHF

Inputs and outputs

LINE-1 IN/LINE-2 IN	VIDEO IN, phono jack (1 each) Input signal : 1 Vp-p, 75 Ω, unbalanced, sync negative AUDIO IN, phono jacks (1 each)(SLV-L49MX, L52PA/PC, L59CL/CS/PR/VZ and X55 MX), (2 each)(SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX) Input level : 327 mVrams Input impedance : more than 47 kilohms
LINE OUT	VIDEO OUT, phono jack (1) Output signal : 1 Vp-p, 75 Ω unbalanced, sync negative AUDIO OUT, phono jacks (1 each)(SLV-L49MX, L52PA/PC, L59CL/CS/PR/VZ and X55 MX), (2 each)(SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX) Standard output : 327 mVrms Load impedance : 47 kilohms Output impedance : less than 10 kilohms

Timer section

Clock	Quartz locked
Timer indication	12 – hour cycle
Timer setting	8 programs per month (max.)
Power back-up	Built-in self-charging capacitor Back-up duration : up to 8 hours at a time

General

Power requirements	110 V AC to 240 V AC, 50/60 Hz (SLV-L59CL/CS/PR, L79HF CL/CL/PR and L89HF CL/CS) 120 V AC, 60 Hz (SLV-L49 MX, L52 PA/PC, L59 VZ, X55 MX, L69HF MX, L72HF PA/PC, L79HF VZ, L89HF MX/VZ and X66HF MX)
Power consumption	18 W (SLV-L49MX, L52PA/PC, L59CL/CS/PR/VZ and X55 MX) 19 W (SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX)
Operating temperature	5°C to 40°C (41°F to 104°F)
Storage temperature	-20°C to 60°C (-4°F to 140°F)
Dimensions	Approx. 335 × 96 × 289 mm (w/h/d) including projecting parts and controls
Mass	Aoorox. 3.7 kg

Supplied accessories

Remote commander (1)
Size AA (R6) batteries (2)
75 Ω coaxial cable with F-type connectors (1)
Audio/video cable (3 phono to 3 phono) (1)(SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX only)
Plug adaptor (1)(SLV-L59 CL/CS/PR, L79HF CL/CS/PR and L89HF CL/CS only)

Design and specifications are subject to change without notice

MICROFILM

VIDEO CASSETTE RECORDER

SONY®

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270˚C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

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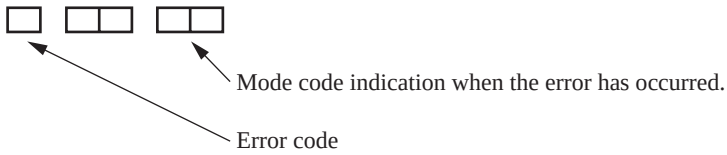
1. ERROR CODE INDICATION

- Error codes are indicated using the lower 5 digits in the fluorescent display tube.
  "At this time, Colon ":" between character is not indicated."



ERROR CODE

0	No error
1	Cam encoder error Loading direction
2	Cam encoder error Unloading direction
3	T reel error
4	S reel error
5	Capstan error
6	Drum error
7	Error on initializing
8	Cassette loading error
9	Reserve

MODE CODE

0	Power-on eject	10	FWD x1	20	REW play
1	Power-on initial	11	FWD x2	21	Cas. loading
2	Power-off eject	12	CUE	22	Tape loading
3	Power-off stop	13	PB-pause	23	Power-off loading
4	FF	14	RVS-pause	24	Mecha. error (Power on)
5	REW	15	RVS x1	25	Power-on eject initial
6	REC	16	RVS x2	26	Power-off eject initial
7	REC- pause	17	REV	27	APC REC
8	Power-on stop	18	Power-off initial	28	Cas. loading
9	PB	19	Mecha. error (Power off)		(No auto PB check)

SECTION 1
GENERAL

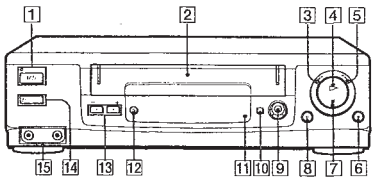
This section is extracted from instruction manual.

Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

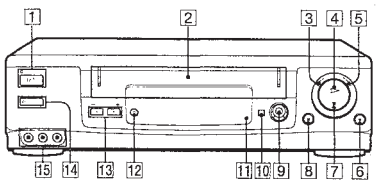
Front panel

SLV-L49 MX, L52 PA/PC, L59 CL/CS/PR/VZ, X55 MX



1 I/⏻ POWER switch/indicator (45)
2 Tape compartment
3 ◀◀ REW (rewind) button (39, 48)
4 ▷ PLAY button (39, 48)
5 ▶▶ FF (fast-forward) button (39, 48)
6 ● REC (record) button (42, 57, 66)
7 ■ STOP button (39)
8 ❚❚ PAUSE button (39)
9 DIAL TIMER button (54)
10 EASY SET UP button (12, 15, 18, 21)
11 Remote sensor (5)
12 REALITY REGENERATOR button (63) (SLV-L52 PA/PC only)
13 CHANNEL/TRACKING +/– buttons (42, 62)
14 ⏏ EJECT button (39)
15 LINE-2 IN VIDEO/AUDIO jacks (65)

SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, X66HF MX



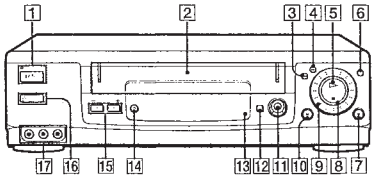
1 I/⏻ POWER switch/indicator (45)
2 Tape compartment
3 ◀◀ REW (rewind) button (39, 48)
4 ▷ PLAY button (39, 48)
5 ▶▶ FF (fast-forward) button (39, 48)
6 ● REC (record) button (42, 57, 66)
7 ■ STOP button (39)
8 ❚❚ PAUSE button (39)
9 DIAL TIMER button (54)
10 EASY SET UP button (12, 15, 18, 21)
11 Remote sensor (5)
12 REALITY REGENERATOR button (63) (SLV-L72HF PA/PC only)
13 CHANNEL/TRACKING +/– buttons (42, 62)
14 ⏏ EJECT button (39)
15 LINE-2 IN VIDEO/AUDIO L/R jacks (65)

continued

Index to parts and controls (continued)

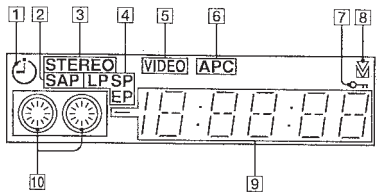
Front panel

SLV-L89HF CL/CS/MX/VZ



1 I/⏻ POWER switch/indicator (45)
2 Tape compartment
3 ◀◀ REW (rewind) button (39, 48)
4 ▶▶ FF (fast-forward) button (39, 48)
5 ▷ PLAY button (39, 48)
6 JOG button (50)
7 ● REC (record) button (42, 57, 66)
8 ■ STOP button (39)
9 Shuttle ring (43, 49)
10 ❚❚ PAUSE button (39)
11 DIAL TIMER button (54)
12 EASY SET UP button (12, 15, 18, 21)
13 Remote sensor (5)
14 REALITY REGENERATOR button (63)
15 CHANNEL/TRACKING +/– buttons (42, 62)
16 ⏏ EJECT button (39)
17 LINE-2 IN VIDEO/AUDIO L/R jacks (65)

Display window

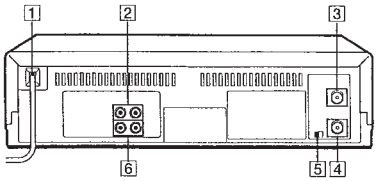


1 Timer indicator (45)
2 SAP (Second Audio Program) indicator (60) (SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX only)
3 STEREO indicator (60) (SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX only)
4 Tape speed indicator (42)
5 VIDEO indicator (43, 67)
6 APC (Adaptive Picture Control) indicator (62)
7 Child Lock indicator (46)
8 Tracking indicator (62)
9 Time counter/clock/line/channel indicator (39, 42, 66)
10 Tape/recording indicator (42)

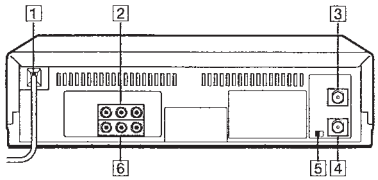
continued

Rear panel

SLV-L49 MX, L52 PA/PC, L59 CL/CS/PR/VZ, X55 MX



SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ, X66HF MX



1 AC power cord (7)

2 LINE-1 IN AUDIO/VIDEO jacks (66) (SLV-L49 MX, L52 PA/PC, L59 CL/CS/PR/VZ and X55 MX only)

LINE-1 IN AUDIO R/L/VIDEO jacks (66) (SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX only)

3 VHF/UHF IN connectors (11, 14, 17, 20)

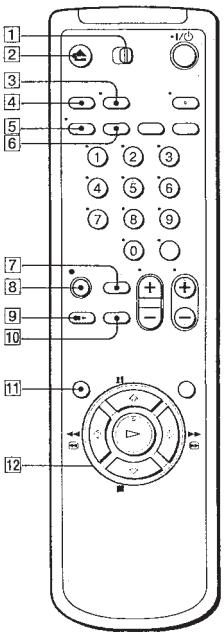
4 VHF/UHF OUT connectors (11, 14, 17, 20)

5 RF (Radio Frequency) UNIT switch (67)

6 LINE OUT AUDIO/VIDEO jacks (8) (SLV-L49 MX, L52 PA/PC, L59 CL/CS/PR/VZ and X55 MX only)

LINE OUT AUDIO R/L/VIDEO jacks (9) (SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX only)

Remote commander



1 TV/VIDEO switch (5)

2 ⏏ EJECT button (39)

3 TV/VIDEO button (6, 43)

4 TRINITRON TV SYNCHRO PLAY button (40)

5 DISPLAY button (43, 51)

6 SP (Standard Play)/EP (Extended Play) button (42)

7 INPUT SELECT button (42, 43, 66)

8 ● REC (record) button (42, 57, 66)

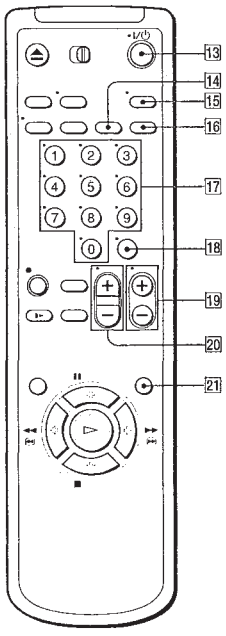
9 ▮► SLOW button (48)

10 x2 button (48)

11 MENU button (24)

12 ▮▮ PAUSE/↑ button (24, 39)
■ STOP/↓ button (24, 39)
◀◀ REW (rewind)/← button (39, 48)
▶▶ FF (fast-forward)/→ button (39, 48)
▷ PLAY/OK button (24, 39)

continued



13 I/⏻ (power) switch (6, 45)

14 CLEAR button (39, 59)

15 AUDIO MONITOR button (60) (SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX only)

16 TIMER button (44, 58)

17 Number buttons (43)

18 ENTER button (43)

19 CH (channel) +/– buttons (6, 42)

20 VOL (volume) +/– buttons (6)

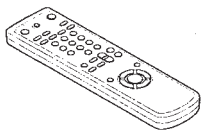
21 REPLAY button (39)

Step 1

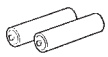
Unpacking

Check that you have received the following items with the VCR:

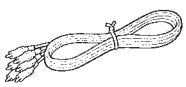
- Remote commander



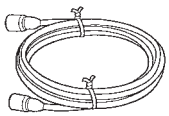
- Size AA (R6) batteries



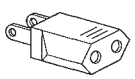
- Audio/video cable (3-phono to 3-phono) (SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX only)



- 75-ohm coaxial cable with F-type connectors



- Plug adaptor (SLV-L59 CL/CS/PR, L79HF CL/CS/PR and L89HF CL/CS only)



If the plug supplied with your VCR does not fit your power outlet, attach the supplied adaptor to the plug.

Checking your model name

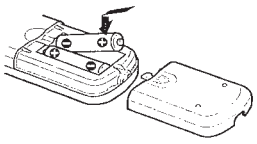
The instructions in this manual are for the 20 models: SLV-L49 MX, L52 PA/PC, L59 CL/CS/PR/VZ, X55 MX, L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX. Check your model number by looking at the rear panel of your VCR. The SLV-L89HF MX is the model used for illustration purposes. Any difference in operation is clearly indicated in the text, for example, "SLV-X66HF MX only".

Step 2

Setting up the remote commander

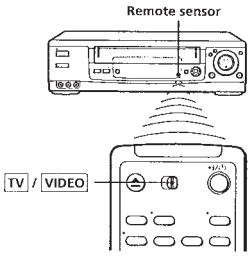
Inserting the batteries

Insert two size AA (R6) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.
Insert the negative (–) end first, then push in and down until the positive (+) end clicks into position.



Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV.



To operate	Set TV / VIDEO to
the VCR	VIDEO and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

Notes

- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

continued

Controlling other TVs with the remote commander (SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX only)

The remote commander is preprogrammed to control non-Sony TVs. If your TV is listed in the table below, set the appropriate manufacturer's code number.

1 Set TV/VIDEO at the top of the remote commander to TV.

2 Hold down I/⏻, and enter your TV's code number(s) using the number buttons. Then release I/⏻.

Now you can use the I/⏻, VOL +/–, CH +/– and TV/VIDEO buttons to control your TV. You can also use the buttons marked with a dot (•) to control a Sony TV. To control the VCR, reset TV/VIDEO to VIDEO.

Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

Manufacturer	Code number
Sony	01
Akai	04
AOC	04
Centurion	12
Coronado	03
Curis-Mathes	12
Daytron	12
Emerson	03, 04, 14
Fisher	11
General Electric	06, 10
Gold Star	03, 04, 17
Hitachi	02, 03
J.C.Penny	04, 12

Manufacturer	Code number
JVC	09
KMC	03
Magnavox	03, 08, 12
Marantz	04, 13
MGA/Mitsubishi	04, 12, 13, 17
NEC	04, 12
Panasonic	06, 19
Philco	03, 04
Philips	08
Pioneer	16
Portland	03
Quasar	06, 18
Radio Shack	05, 14

Manufacturer	Code number
RCA	04, 10
Sampo	12
Sanyo	11
Scott	12
Sears	07, 10, 11
Sharp	03, 05, 18
Sylvania	08, 12
Teknika	03, 08, 14
Toshiba	07
Wards	03, 04, 12
Yorx	12
Zenith	15

Notes

- If the TV uses a different remote control system from the one programmed to work with the VCR, you cannot control your TV with the remote commander.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote commander, the code number may change. Set the appropriate code number every time you replace the batteries.

Step 3

Hookups

Selecting the best hookup option

There are many ways in which your VCR can be hooked up. To hook up your VCR so that it works best for you, first scan through the table below. Then use the accompanying diagrams and procedures on the following pages to set up your VCR.

If you have	Use	Refer to
TV that has audio/video input	**Audio/video (A/V) hookup,** then follow one of the hookups below.	**Pages 8 to 10**
Antenna only, no cable TV	**Hookup 1**	**Pages 11 to 13**
No cable box, or cable box with only a few scrambled channels	**Hookup 2**	**Pages 14 to 16**
Cable box, with many scrambled channels	**Hookup 3**	**Pages 17 to 19**
Cable box with only a few scrambled channels, using an A/B switch	**Hookup 4**	**Pages 20 to 23**

After you've completed the connections, follow the instructions for setup. During setup, if you need more details on the procedure described, page numbers are provided where you can find complete, step-by-step instructions.

After you've completed the setup, you're ready to use your VCR. Procedures differ depending on the hookup you used. For an overview, refer to "Quick reference to using the VCR" on the back cover.

Before you get started

- Turn off the power to all equipment.
- Do not connect the AC power cords until all of the connections are completed.
- Be sure you make connections firmly. Loose connections may cause picture distortion.
- If your TV doesn't match any of the examples provided, see your nearest Sony dealer or qualified technician.

continued

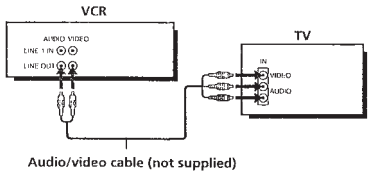
Audio/video (A/V) hookup Pages 8 to 10

If your TV has audio/video (A/V) input jacks, you will get a better picture and sound when you hook up your VCR using these connections. If your TV doesn't have A/V inputs, see the following pages for antenna or cable hookups.

If you're not planning to use your VCR to record programs, you're finished setting up the VCR after you've made the connections shown on pages 8 and 9.
If you want to record off-air or off your cable TV system, complete these connections first, and then go to the following pages for antenna or cable hookups.

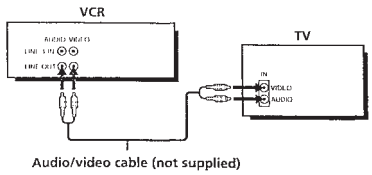
For SLV-L49 MX, L52 PA/PC, L59 CL/CS/PR/VZ and X55 MX

A Use this hookup if your TV has stereo jacks



Audio/video cable (not supplied)

B Use this hookup if your TV doesn't have stereo jacks



Audio/video cable (not supplied)

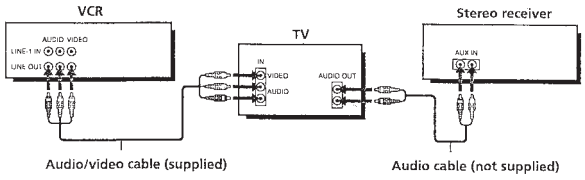
Note

- If you use the Trinitron TV Synchro Play function (see page 40), the A/V connection is necessary. (If your TV has two or more inputs, connect the audio/video cable to the VIDEO IN 1 jacks.)

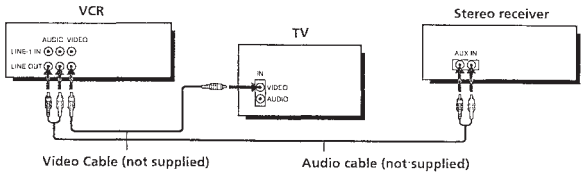
For SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX

For a true "home theater" experience, you should connect the audio outputs of your VCR or TV to your stereo system.

A Use this hookup if your TV has stereo jacks



B Use this hookup if your TV doesn't have stereo jacks



Notes

- To play a tape in stereo, you must use the A/V connection.
- If you use the Trinitron TV Synchro Play function (see page 40), the A/V connection is necessary. (If your TV has two or more inputs, connect the audio/video cable to the VIDEO IN 1 jacks.)

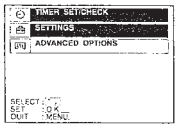
continued

Step 3: Hookups (continued)

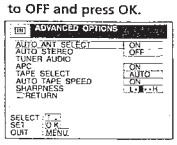
A/V hookup: VCR setup

After you've connected your TV and completed antenna or cable hookup, use the following procedure to set up the VCR.

Press MENU and select ADVANCED OPTIONS.



Set AUTO ANT SELECT to OFF and press OK.



For details, see page 64.

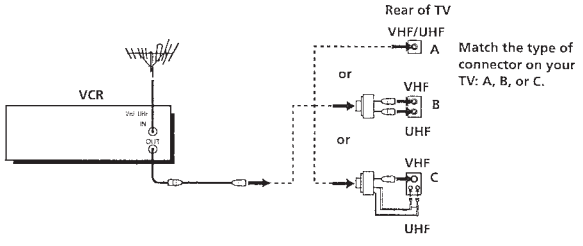
Hookup 1 Pages 11 to 13

Antenna hookup

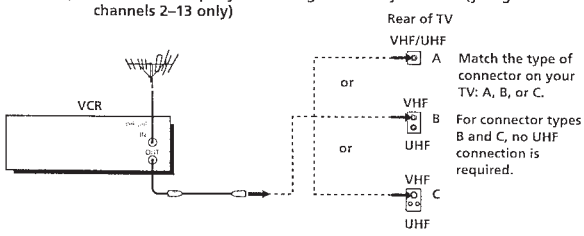
Make the following connections if you're using an antenna (if you don't have cable TV).

A Use this hookup if you're using:

- VHF/UHF antenna (you get channels 2–13 and channels 14 and higher)
- UHF-only antenna (you get channels 14 and higher)
- Separate VHF and UHF antennas



B Use this hookup if you're using a VHF-only antenna (you get channels 2–13 only)



If you cannot connect your antenna cable to the VCR directly

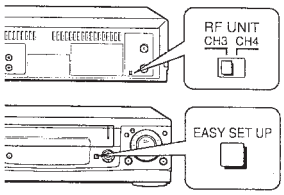
If your antenna cable is a flat cable (300-ohm twin lead cable), attach an external antenna connector (not supplied) so you can connect the cable to the VHF/UHF IN connector. If you have separate cables for VHF and UHF antennas, you should use a U/V band mixer (not supplied). For details, see page 68.

continued

Step 3: Hookups (continued)

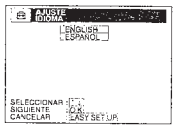
Hookup 1: VCR setup

1 Set the RF UNIT switch to CH3 or CH4, whichever channel is not used in your area. If both are used, set the switch to either channel. For details, see page 67. If you made A/V connections (from page 8), you can skip this step.

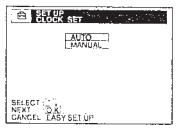


2 Press EASY SET UP on the VCR.

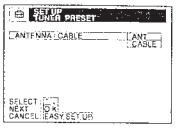
❶ The IDIOMA menu appears. Change the on-screen display language to English (ENGLISH) if desired, and press OK. For details, see page 24.



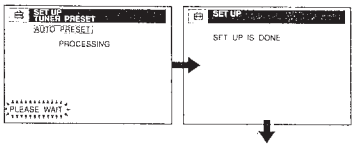
❷ The CLOCK SET menu appears. Select MANUAL and press OK. Then set the clock. For details, see page 29.



❸ The TUNER PRESET menu appears. Set ANTENNA/CABLE to ANT and press OK. For details, see page 31.



❹ The AUTO PRESET starts.



Normal display

continued

Hookup 2 Pages 14 to 16

No cable box, or cable box with only a few scrambled channels

Recommended use

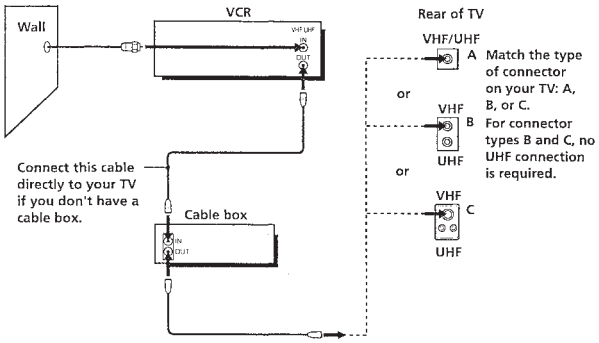
Use this hookup if you do not have a cable box. Also use this hookup if your cable system scrambles only a few channels.

What you can do with this hookup

- Record any unscrambled channel by selecting the channel on the VCR

What you can't do

- Record scrambled channels that require a cable box

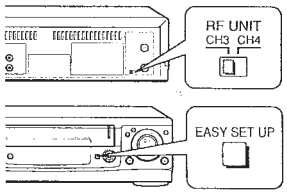


Hookup 2: VCR setup

1 Set the RF UNIT switch to CH3 or CH4, whichever channel is not used in your area. If both are used, set the switch to either channel. For details, see page 67. If you made A/V connections (from page 8), you can skip this step.

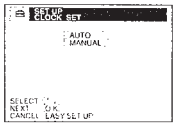
2 Turn on your cable box.

3 Press EASY SET UP on the VCR.

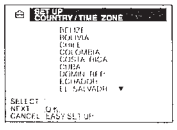


❶ The IDIOMA menu appears. Change the on-screen display language to English (ENGLISH) if desired, and press OK. For details, see page 24.

❷ The CLOCK SET menu appears. Select AUTO and press OK. For details, see page 25.

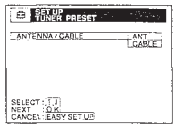


❸ The COUNTRY/TIME ZONE menu appears. Select the country you want to set and press OK. You can select following countries:
BELIZE ⟷ BOLIVIA ⟷ CHILE ⟷
COLOMBIA ⟷ COSTA RICA ⟷ CUBA ⟷
DOMIN. REP. ⟷ ECUADOR ⟷
EL SALVADR ⟷ GUATEMALA ⟷
GUYANA ⟷ HONDURAS ⟷ JAMAICA ⟷
MEX-CENT. ⟷ MEX-MOUNT. ⟷
MEX-PACIF. ⟷ MEX-S. EAST ⟷
NICARAGUA ⟷ PANAMA ⟷ PERU ⟷
SURINAME ⟷ TRIN. & TOB. ⟷
VENEZUELA

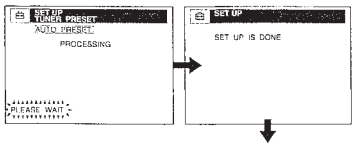


continued

❹ The TUNER PRESET menu appears. Set ANTENNA/CABLE to CABLE and press OK. For details, see page 31.



❺ The AUTO PRESET starts.



Normal display

Automatic clock setting

Once you've set up the VCR, it automatically sets the clock the first time you turn off the VCR. After that, whenever you turn off the VCR, it checks the time and adjusts the clock, even for Daylight Saving Time. The VCR sets the clock by picking up time signals provided by Sony Entertainment Television (SETV).

If you want to use the timer to record right away, or if the cable TV station in your area does not broadcast SETV, or if SETV in your area does not carry time signals, set the clock manually. For details, see page 29.

Note

- The Daylight Saving Time start and end days may differ depending on the year. To ensure correct switching, select ON or OFF for the DAYLIGHT SAVING setting (page 28).

Hookup 3 — Pages 17 to 19

Cable box with many scrambled channels

Recommended use

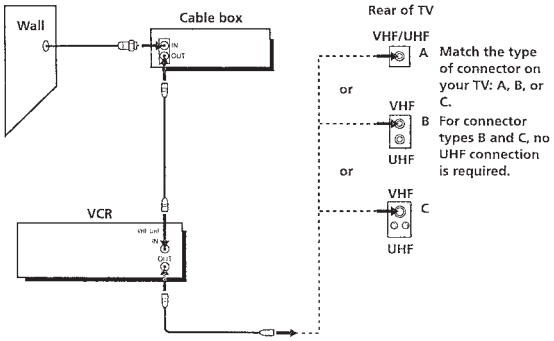
Use this hookup if your cable system scrambles all or most channels.

What you can do with this hookup

- Record any channel by selecting the channel on the cable box

What you can't do

- Record with the cable box turned off
- Record one channel while watching another channel

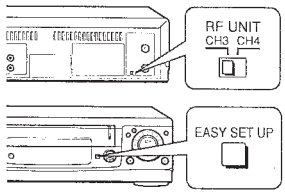


continued

Step 3: Hookups (continued)

Hookup 3: VCR setup

1 Set the RF UNIT switch to CH3 or CH4, whichever channel is not used in your area. If both are used, set the switch to either channel. For details, see page 67. If you made A/V connections (from page 8), you can skip this step.

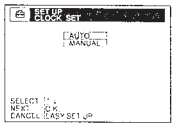


2 Turn on your cable box.

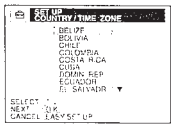
3 Press EASY SET UP on the VCR.

❶ The IDIOMA menu appears. Change the on-screen display language to English (ENGLISH) if desired, and press OK. For details, see page 24.

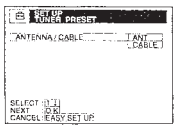
❷ The CLOCK SET menu appears. Select AUTO and press OK. For details, see page 25.



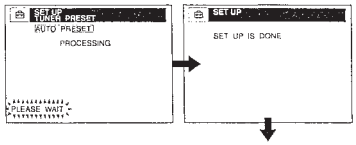
❸ The COUNTRY/TIME ZONE menu appears. Select the country you want to set and press OK. You can select following countries:
BELIZE ⟷ BOLIVIA ⟷ CHILE ⟷
COLOMBIA ⟷ COSTA RICA ⟷ CUBA ⟷
DOMIN. REP. ⟷ ECUADOR ⟷
EL SALVADR ⟷ GUATEMALA ⟷
GUYANA ⟷ HONDURAS ⟷ JAMAICA ⟷
MEX-CENT. ⟷ MEX-MOUNT. ⟷
MEX-PACIF. ⟷ MEX-S. EAST ⟷
NICARAGUA ⟷ PANAMA ⟷ PERU ⟷
SURINAME ⟷ TRIN. & TOB. ⟷
VENEZUELA



❹ The TUNER PRESET menu appears. Set ANTENNA/CABLE to ANT and press OK. For details, see page 31.



❺ The AUTO PRESET starts.



Normal display

Automatic clock setting

To use the Auto Clock Set feature with this hookup, you need to manually select Sony Entertainment Television (SETV).

1 Tune the cable box to SETV.

2 Select AUTO in the CLOCK SET menu to turn on the Auto Clock Set feature.

3 Turn off the VCR. It automatically sets the clock and adjusts for Daylight Saving Time by picking up the time signal.

If you want to use the timer to record right away, or if the cable TV station in your area does not broadcast SETV, or if SETV in your area does not carry time signals, set the clock manually. For details, see page 29.

Notes

- To use the Auto Clock Set feature, leave the cable box on.
- The Daylight Saving Time start and end days may differ depending on the year. To ensure correct switching, select ON or OFF for the DAYLIGHT SAVING setting (page 28).

continued

Step 3: Hookups (continued)

Hookup 4 — Pages 20 to 23

Cable box with only a few scrambled channels, using an A/B switch

Recommended use

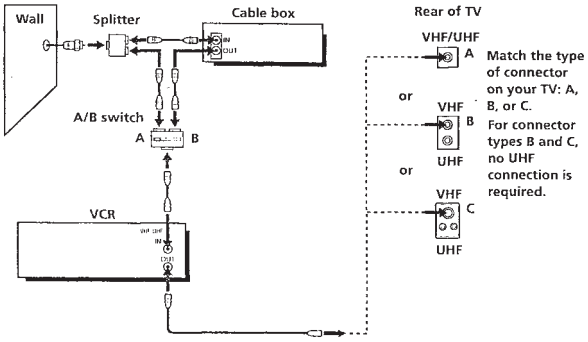
By using an A/B switch (not supplied), this hookup allows you to record both scrambled and unscrambled channels conveniently.

What you can do with this hookup

- Record any unscrambled channel by selecting the channel directly on the VCR (the A/B switch is set to "A")
- Record any scrambled channel by selecting the channel on the cable box (the A/B switch is set to "B")

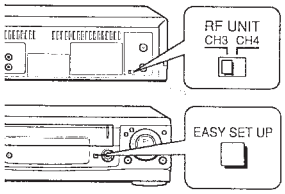
What you can't do

- Record one scrambled channel while watching another channel (the A/B switch is set to "B")



Hookup 4: VCR setup

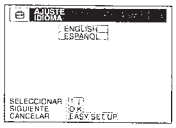
1 Set the RF UNIT switch to CH3 or CH4, whichever channel is not used in your area. If both are used, set the switch to either channel. For details, see page 67. If you made A/V connections (from page 8), you can skip this step.



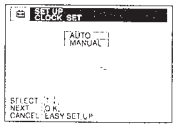
2 Set the A/B switch to "A."

3 Press EASY SET UP on the VCR.

❶ The IDIOMA menu appears. Change the on-screen display language to English (ENGLISH) if desired, and press OK. For details, see page 24.



❷ The CLOCK SET menu appears. Select AUTO and press OK. For details, see page 25.



❸ The COUNTRY/TIME ZONE menu appears. Select the country you want to set and press OK. You can select following countries:
BELIZE ⟷ BOLIVIA ⟷ CHILE ⟷
COLOMBIA ⟷ COSTA RICA ⟷ CUBA ⟷
DOMIN. REP. ⟷ ECUADOR ⟷
EL SALVADR ⟷ GUATEMALA ⟷
GUYANA ⟷ HONDURAS ⟷ JAMAICA ⟷
MEX-CENT. ⟷ MEX-MOUNT. ⟷
MEX-PACIF. ⟷ MEX-S. EAST ⟷
NICARAGUA ⟷ PANAMA ⟷ PERU ⟷
SURINAME ⟷ TRIN. & TOB. ⟷
VENEZUELA

continued

Automatic clock setting

Once you've set up the VCR, it automatically sets the clock the first time you turn off the VCR. After that, whenever you turn off the VCR, it checks the time and adjusts the clock, even for Daylight Saving Time. The VCR sets the clock by picking up time signals provided by Sony Entertainment Television (SETV).

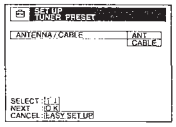
If you want to use the timer to record right away, or if the cable TV station in your area does not broadcast SETV, or if SETV in your area does not carry time signals, set the clock manually. For details, see page 29.

Notes

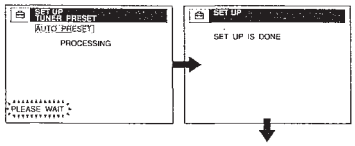
- To use the Auto Clock Set feature, set the A/B switch to "A".
- The Daylight Saving Time start and end days may differ depending on the year. To ensure correct switching, select ON or OFF for the DAYLIGHT SAVING setting (page 28).

Step 3: Hookups (continued)

❹ The TUNER PRESET menu appears. Set ANTENNA/CABLE to CABLE and press OK. For details, see page 31.



❺ The AUTO PRESET starts.

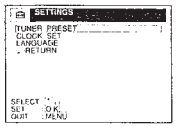


Normal display

4 Preset the cable box output channel (usually 2, 3 or 4). For details, see page 34.

❶ Press MENU, then select SETTINGS and press OK.

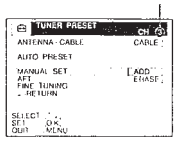
❷ Select TUNER PRESET and press OK.



❸ Enter the cable box output channel.

❹ Set MANUAL SET to ADD and press OK.

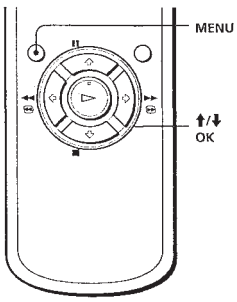
Cable box output channel



❺ Press MENU to exit the menu.

Selecting a language

You can change the on-screen display language.



1 MENU

Press MENU, then press ↑/↓ to highlight AJUSTES and press OK.

When using the EASY SET UP procedure, skip steps 1 and 2.

2 Press ↑/↓ to highlight SELECCION DEL IDIOMA, then press OK.

3 Press ↑/↓ to highlight ENGLISH or ESPAÑOL, then press OK.

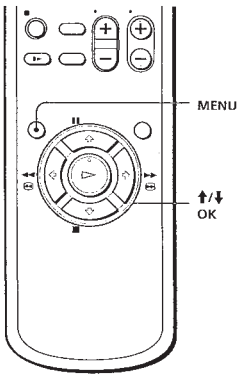
4 MENU

Press MENU to exit the menu.

Tip

- If you want to return to the previous menu, highlight RETURN and press OK.

Setting the clock



Using the Auto Clock Set feature

Sony Entertainment Television (SETV) transmits time signals with its broadcasts. If the cable TV station in your area broadcasts SETV and transmits these time signals as is, your VCR can pick up these time signals to automatically set the clock.

The Auto Clock Set feature works only if SETV in your area broadcasts time signals. If SETV in your area does not broadcast time signals or if you select Hookup 1 on page 11, set the time manually (page 29).

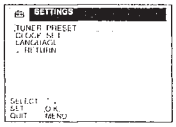
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.
- Press INPUT SELECT so that a channel number appears in the VCR's display window.

1 MENU

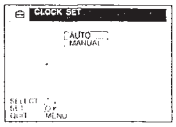
Press MENU, then press ↑/↓ to highlight SETTINGS and press OK.

When using the EASY SET UP procedure, skip steps 1 and 2.



2

Press ↑/↓ to highlight CLOCK SET, then press OK.

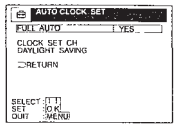


continued

Setting the clock (continued)

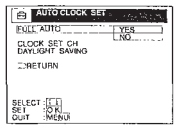
3

Press ↑/↓ to highlight AUTO, then press OK.



4

Press ↑/↓ to highlight FULL AUTO, then press OK.



5

Press ↑/↓ to highlight YES, then press OK.

6 MENU

Press MENU to exit the menu.

7

To activate the Auto Clock Set function, turn off the VCR.

The VCR automatically sets the clock by searching for the SETV broadcast that carries time signals and sets Daylight Saving Time (if applicable).

If your clock is set to the wrong Daylight Saving Time, you can adjust these settings without turning off the Auto Clock Set feature (page 27).

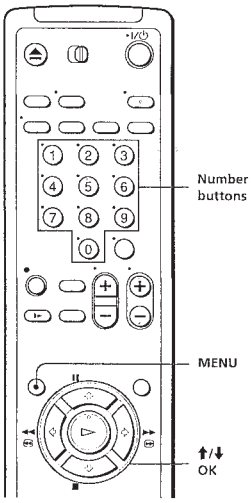
Tip

- If you want to return to the previous menu, highlight RETURN and press OK.

Notes

- The clock cannot be set automatically if you do not receive SETV broadcast that carries time signals in your area. If so, set the clock manually (page 29).
- Depending on the channels allotted to SETV in your area, setting the clock automatically may take up to about 30 minutes. If nothing happens even after you wait about 30 minutes after turning off the VCR, turn the VCR on and then off again. If the clock is not set even after about another 30 minutes, set the clock manually (page 29).

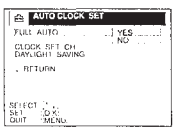
If the clock is not activated



1

Follow steps 1 to 4 in "Using the Auto Clock Set feature."

The AUTO CLOCK SET menu is displayed.

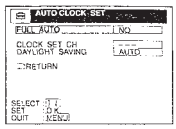


continued

Setting the clock (continued)

2

Press ↑/↓ to highlight NO for FULL AUTO and press OK.



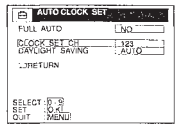
3

Press ↑/↓ to highlight the item you want to set and press OK. Then press ↑/↓ to make the setting and press OK.

- For CLOCK SET CH

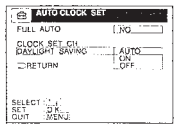
  Leave the setting to "– – –" to have the VCR automatically search for the SETV broadcast.

  Or, press the number buttons to select the SETV channel if you know it.



- For DAYLIGHT SAVING

  Select ON or OFF (standard time), or AUTO to have the VCR automatically set the daylight saving time.



4 MENU

Press MENU to exit the menu.

5

To activate the Auto Clock Set function, turn off the VCR.

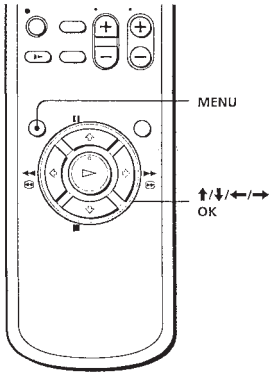
Tip

- If you want to return to the previous menu, highlight RETURN and press OK.

Notes

- The Daylight Saving Time start and end days may differ depending on the year. To ensure correct switching, select ON or OFF for the DAYLIGHT SAVING setting.
- If nothing happens even after you wait about 30 minutes after turning off the VCR, turn the VCR on and then off again. If the clock is not set even after another about 30 minutes, set the clock manually (page 29).
- Some cable TV stations broadcasting SETV do not transmit time signals. If so, set the clock manually (page 29).

Using Manual Clock Set



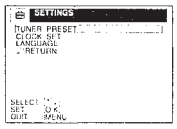
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.

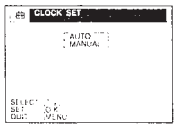
1 MENU

Press MENU, then press ↑/↓ to highlight SETTINGS and press OK.

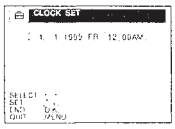
When using the EASY SET UP procedure, skip steps 1 and 2.



2 Press ↑/↓ to highlight CLOCK SET, then press OK.



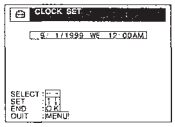
3 Press ↑/↓ to highlight MANUAL and press OK.



continued

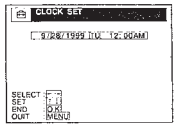
Setting the clock (continued)

4 Press ↑/↓ to set the month.



5 Press → to highlight the day and press ↑/↓ to set the day.

The day of the week is set automatically.



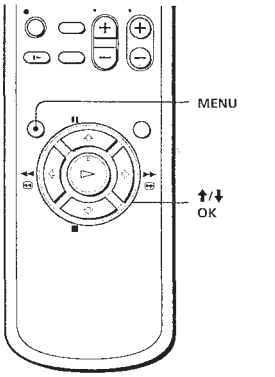
6 Set the year, hour, and minutes in the same way as the day.

7 Press OK to start the clock.

Tip

- If you want to return to the previous menu, highlight RETURN and press OK.

Presetting channels



This VCR is capable of receiving VHF channels 2 to 13, UHF channels 14 to 69 and unscrambled CATV channels 1 to 125. First, we recommend that you preset the receivable channels in your area using automatic presetting. Then, if there are any unwanted channels, disable them manually. If you have decided which channels you wish to preset, set them directly using manual presetting.

Before you start...

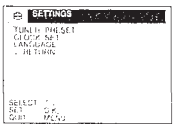
- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.

Presetting all receivable channels automatically

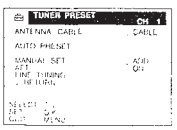
1 MENU

Press MENU, then press ↑/↓ to highlight SETTINGS and press OK.

When using EASY SET UP procedure, skip steps 1 and 2.



2 Press ↑/↓ to highlight TUNER PRESET, then press OK.



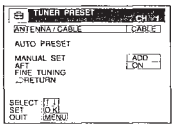
continued

Presetting channels (continued)

3 Press ↑/↓ to highlight ANTENNA/CABLE, then press OK.

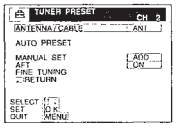
4 • To preset cable TV channels:

Press ↑/↓ to set ANTENNA/CABLE to CABLE, then press OK.



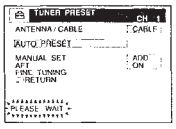
• To preset VHF and UHF channels:

Press ↑/↓ to set ANTENNA/CABLE to ANT, then press OK.



5 Press ↑/↓ to highlight AUTO PRESET, then press OK.

All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.



Tips

- When receiving a VHF, UHF, or CATV channel, the display changes as follows each time you press DISPLAY.

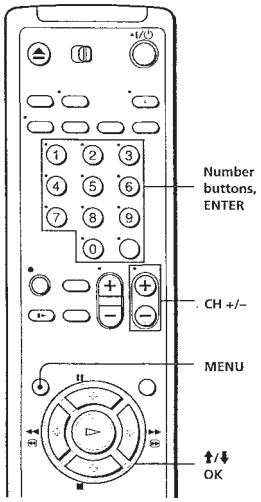
Channel number
↓
Remaining tape length, and time counter
↓
The bar indicator and pointer for searching a specific point
↓
No display

- If you want to return to the previous menu, highlight RETURN and press OK.

continued

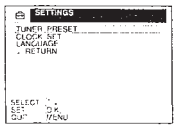
Presetting channels (continued)

Presetting/disabling channels manually



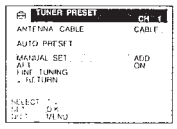
1 MENU

Press MENU, then press ↑/↓ to highlight SETTINGS and press OK.



2

Press ↑/↓ to highlight TUNER PRESET, then press OK.

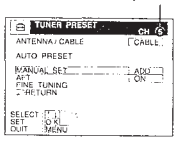


3 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪

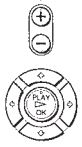
- To preset a channel:

1 Press the number buttons to enter the channel number, then press ENTER.
2 Press OK.
3 Press ↑/↓ to set MANUAL SET to ADD, then press OK.

Channel to be preset



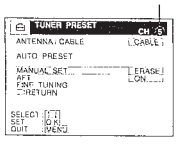
• CH



- To disable a channel:

1 Press CH +/– to select the channel number.
2 Press OK.
3 Press ↑/↓ to set MANUAL SET to ERASE, then press OK.

Channel to be disabled



4 MENU

Repeat step 3 to preset or disable channels as required, then press MENU.

Tip

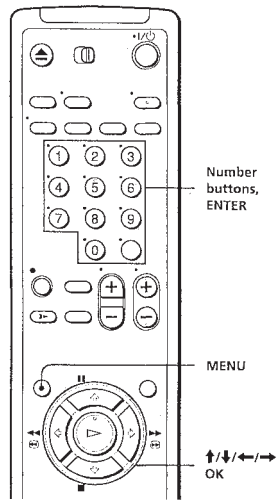
- If you want to return to the previous menu, highlight RETURN and press OK.

continued

Presetting channels (continued)

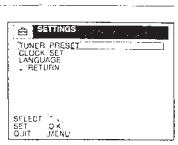
If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture of a channel is not clear, you can also use the manual tuning function.



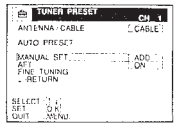
1 MENU

Press MENU, then press ↑/↓ to highlight SETTINGS and press OK.

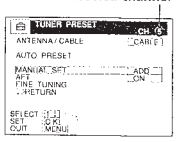


2

Press ↑/↓ to highlight TUNER PRESET, then press OK.

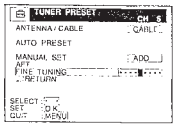


3 Press the number buttons to select the channel you want to fine-tune, then press ENTER.



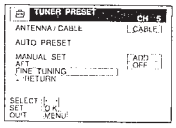
4 Press ↑/↓ to highlight FINE TUNING, then press OK.

The fine tuning meter appears.



5 Press ←/→ to adjust to a clearer picture, then press OK.

Note that the AFT setting switches to OFF.



6 MENU

Press MENU to exit the menu.

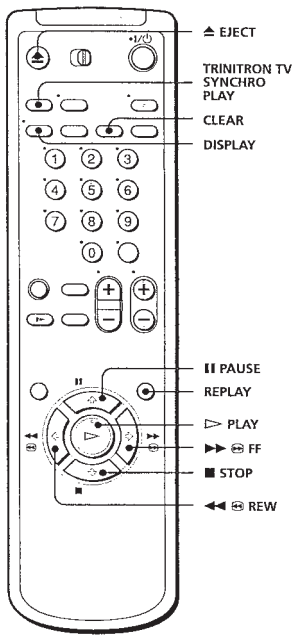
Tips

- To select the channel in step 3 above, you can also use the CH +/– buttons. In this case, you don't need to press ENTER.
- If you want to return to the previous menu, highlight RETURN and press OK.

Note

- When adjusting FINE TUNING, the menu may become difficult to read due to interference from the picture being received.

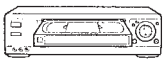
Playing a tape



1 Turn on your TV and set it to the video channel.

2 Insert a tape.

The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.



3 Press ▷ PLAY.

When the tape reaches the end, it will rewind automatically.

Additional tasks

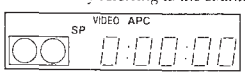
To	Press
Stop play	■ STOP
Pause play	❚❚ PAUSE
Resume play after pause	❚❚ PAUSE or ▷ PLAY
Fast-forward the tape	▶▶ FF during stop
Rewind the tape	◀◀ REW during stop
Eject the tape	⏏ EJECT

To play a recently watched scene

You can immediately rewind and playback the scene you want to watch again.
During playback, press REPLAY up to four times. The VCR rewinds the tape about ten seconds on the counter for each press of the button, and restarts playback.

To use the time counter

At the point on the tape that you want to find later, press CLEAR. The counter in the display window resets to "0:00:00." Search for the point afterwards by referring to the counter.



To display the counter on the TV screen, press DISPLAY repeatedly until the time counter appears. To turn off the display, press DISPLAY twice.

Notes

- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- While setting the menu on the TV screen, you cannot use ▷ PLAY, ❚❚ PAUSE, ▶▶ FF, ◀◀ REW, or ■ STOP buttons.
- The counter resets to "0:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.

continued

Playing a tape (continued)

Turning on the VCR and TV, and starting playback automatically (Trinitron TV Synchro Play)

You can only use this function if your TV is made by Sony (Trinitron TV).

How to connect to use this function

Connect the VCR and TV with the audio/video cable (see "Audio/video (A/V) hookup" on pages 8 and 9). Be sure to connect the audio/video cable to the VIDEO IN 1 jacks on the TV if the TV has two inputs or more. The TV must be placed where it will respond to the remote commander while you are pointing it at the VCR.

Operation

Make sure that the TV's power is in standby mode.

Press TRINITRON TV SYNCHRO PLAY and hold the remote commander in place for about two seconds.

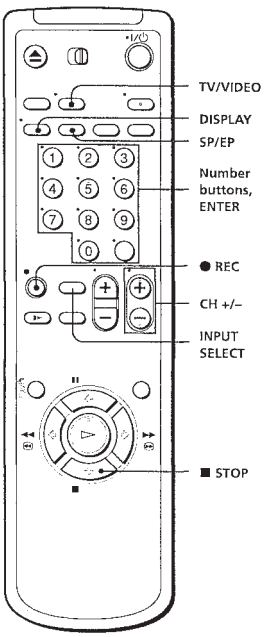
The VCR and TV turn on, and the TV is set to the video channel. If there is a tape in the VCR, playback starts automatically.

Notes

- If the Trinitron TV Synchro Play function does not work properly:
  - Wait a few moments, and press the button again.
  - Replace both of the batteries with new ones, and press the button again.

  Note that this function may not operate some Sony TVs because of the remote commander's signal limitations.
- Do not press TRINITRON TV SYNCHRO PLAY during playback. If you do so, the TV's input source will momentarily switch to the TV's tuner.

Recording TV programs



1 Turn on your TV and set it to the video channel.
To record from a cable box, turn it on.

2 Insert a tape with its safety tab in place.

continued

Recording TV programs (continued)

3 INPUT SELECT

Press INPUT SELECT until a channel number appears in the display window.

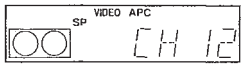
4 CH

Press CH +/– to select the channel you want to record.

5 SP / EP

Press SP/EP to select the tape speed, SP or EP.

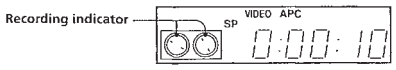
EP (Extended Play) provides recording time three times as long as SP (Standard Play), however, SP produces better picture and audio quality.



6 ●REC

Press ● REC to start recording.

The recording indicator lights up red in the display window.

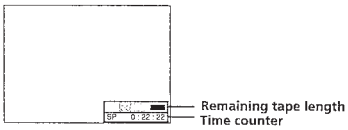


To stop recording

Press ■ STOP.

To check the remaining tape length

Press DISPLAY repeatedly until the display below appears. The white bar indicates the approximate length of tape remaining.



To watch another TV program while recording

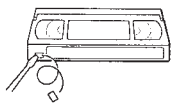
1. Press TV/VIDEO to turn off the VIDEO indicator in the display window.
2. If the TV is connected to the VCR's LINE OUT jacks, set the TV to TV input; if not, skip this step.
3. Select another channel on the TV.

To select the channel using the shuttle ring (SLV-L89HF CL/CS/MX/VZ only)

To select a channel in step 4 above, you can also use the shuttle ring. During stop, turn the shuttle ring clockwise for higher channels or counterclockwise for lower channels. The VCR switches the channel in the preset order.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.



Tips

- To select a channel, you can use the number buttons on the remote commander. Enter the channel number, then press ENTER.
- You can select a video source from the LINE-1 IN or LINE-2 IN jacks using the INPUT SELECT button.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV. When using a cable box, make sure to leave it on.

Notes

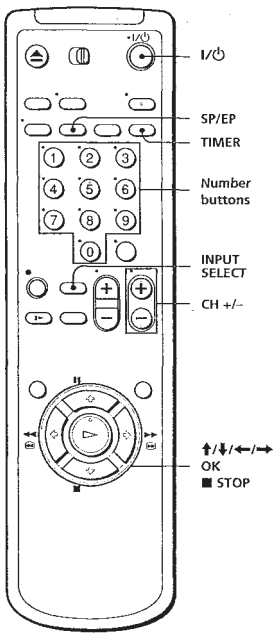
- The display does not appear during still (pause) mode or slow-motion playback.
- It may take up to one minute for the VCR to calculate and display the remaining tape length after you press DISPLAY.

Recording TV programs using the timer

You can preset up to eight programs at a time.

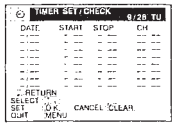
Before you start...

- Check that the VCR clock is set to the correct time.
- Turn on your TV and set it to the video channel. When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.



1 TIMER

Press TIMER to display TIMER SET/CHECK.

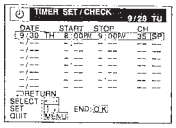


2 Press ↑/↓ to highlight the line that is to be set, then press OK.

3 Set the date, start and stop times, channel number and tape speed:

1 Press ↑/↓ to set each item.
2 Press → to highlight and set each item in turn.

To correct a setting, press ← to return to that setting and reset.



To record the same program every day or the same day every week, press ↓ while the date is highlighted. For details, see "Daily/weekly recording" below.

INPUT SELECT

To record from a source connected to the LINE-1 IN or LINE-2 IN jacks, press INPUT SELECT to display "L1" or "L2" in the "CH" position.

4 Press OK to confirm the setting.

To enter another setting, highlight the next line and repeat step 3.

5 TIMER

Press TIMER.

6 I/⏻

Press I/⏻ to turn off the VCR.

The ⏲ indicator appears in the display window and the VCR stands by for recording.
When using a cable box, leave it on.

continued

Tips

- To set the channel, you can also use the CH+/– or number buttons.
- To show the TIMER SET/CHECK menu, you can also use the MENU button. Press MENU, then press ↑/↓ to highlight TIMER SET/CHECK and press OK.
- (SLV-L89HF CL/CS/MX/VZ only) You can set the channel with the shuttle ring during stop.
- To set the tape speed, you can also use the SP/EP button.
- When you are recording a program in the SP mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to the EP mode. Note that some noises will appear on the picture when the tape speed is changed. If you want to keep the tape speed, set AUTO TAPE SPEED to OFF in the ADVANCED OPTIONS menu (page 64).
- If you want to return to the previous menu and continue with other operations after setting the timer, press ↓ to highlight RETURN, then press OK.
  The display returns to the MENU screen.
  If you are finished using the VCR, turn off the power before the timer recording starts.

To stop recording

To stop the VCR while recording, press ■ STOP.

Daily/weekly recording

In step 3 above, press ↓ to select the recording pattern. Each time you press ↓, the indication changes as shown below. Press ↑ to change the indication in reverse order.

the current date → SU-SA → MO-SA → MO-FR → EVERY SA → ..... → EVERY MO → EVERY SU → 1 month later → (dates count down) → the current date

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press I/⏻. The ⏲ indicator disappears from the display window and the VCR switches on. Remember to press I/⏻ to reset the VCR to the timer recording standby mode after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV program.

To lock the VCR after setting the timer (Child Lock)

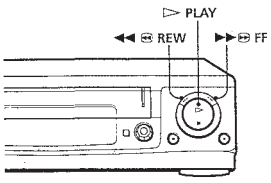
While the VCR turns on, hold down I/⏻ POWER on the VCR until the 🔑 indicator appear in the display window. The VCR turns off and the 🔑 indicator remains lit. The VCR will not work except for timer recording.

To unlock the VCR, hold down I/⏻ POWER on the VCR until the 🔑 indicator disappears from the display window. The VCR is unlocked and turns on.

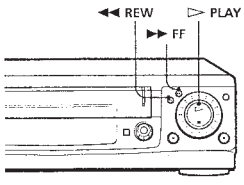
To stop timer recording while the VCR is locked, press ■ STOP. The recording stops and the VCR is unlocked.

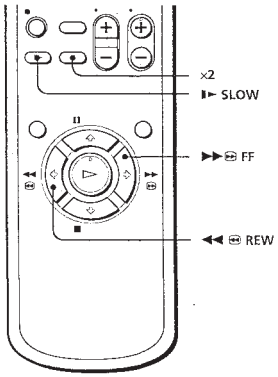
Playing/searching at various speeds

SLV-L49 MX, L52 PA/PC, L59 CL/CS/PR/VZ, X55 MX, L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ and X66HF MX



SLV-L89HF CL/CS/MX/VZ





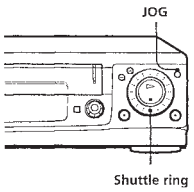
Playback options	Operation
View the picture during fast-forward or rewind	During fast-forward, hold down ▶▶ FF/▶▶ FF. During rewind, hold down ◀◀ REW/◀◀ REW.
Play at high speed	• During playback, press ▶▶ FF or ◀◀ REW on the remote commander. • During playback, hold down ▶▶ FF/▶▶ FF or ◀◀ REW/◀◀ REW. When you release the button, normal playback resumes.
Play at twice the normal speed	During playback, press ×2.
Play in slow motion	During playback or pause, press ▮▸ SLOW.
Play frame by frame	During pause, press ▶▶ FF or ◀◀ REW on the remote commander. Hold down the button to play one frame each second.
Rewind and start play	During stop, press ▷ PLAY on the VCR while holding down ◀◀ REW/◀◀ REW on the VCR.

To resume normal playback

Press ▷ PLAY.

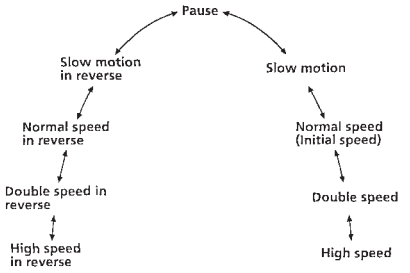
Using the shuttle ring (SLV-L89HF CL/CS/MX/VZ only)

With the shuttle ring, you can operate a variety of playback options.
There are two ways for using the shuttle ring, normal mode and jog mode.



To use the shuttle ring in normal mode

During playback or pause, turn the shuttle ring clockwise or counterclockwise. Each change in the shuttle ring position changes the playback mode in the following way.



continued

To use the shuttle ring in jog mode

Use this mode for frame-by-frame playback.

Press JOG to enter the jog mode. The JOG button lights up. If you change to jog mode during any playback mode, playback pauses so you can see a still picture. Each change in the shuttle ring position shifts the picture one frame. To shift frames in reverse, turn the shuttle ring counterclockwise.
The frame shift speed depends on the speed you turn the shuttle ring.

To resume normal mode, press JOG again. The JOG button goes off.

Tip

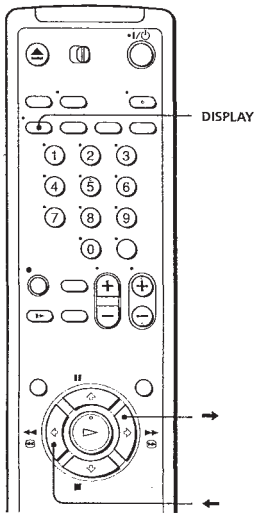
- Adjust the picture using the TRACKING +/– buttons if:
  – Streaks appear while playing in slow motion.
  – The picture shakes while pausing.
  To set tracking to the center position, press both buttons (+/–) at the same time.

Notes

- The sound is muted during these operations.
- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The picture may have snow:
  –when playing at high speed in reverse
  –when playing in reverse slow motion (SLV-L89HF CL/CS/MX/VZ only)
  –when playing in reverse (SLV-L89HF CL/CS/MX/VZ only)

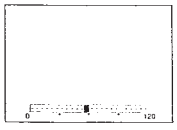
Searching for a selected point on the tape

You can easily find a selected point by moving the pointer on the TV screen. The VCR fast-forwards or rewinds to the point you indicate and starts playback automatically.



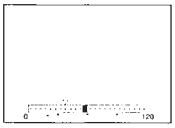
1 Press DISPLAY repeatedly until the bar indication appears on the TV screen.

A cursor (■) indicating the current position of the tape appears on the bar indication. If the cursor does not appear, play the tape a few moments (by pressing ▷ PLAY, ▶▶ ⊖ FF or ◀◀ ⊕ REW) until the cursor appears.



2 Press ⬅/➡ to move the pointer (▽) to the point where you want to start playback.

The VCR starts searching and the cursor (■) moves toward the pointer. When the VCR locates the marked point, playback starts.



continued

To cancel searching

Press ▷ PLAY or ■ STOP.

To turn off the bar indication

Press DISPLAY again.

Notes

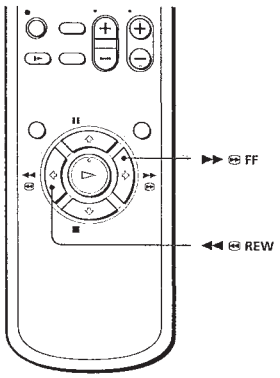
- The figure on the bar indication represents the total time length of the inserted tape as shown below.
  The total time length may not be displayed correctly for:
  – tapes other than T-60, T-120, or T-160
  – tapes recorded in more than one tape speed mode.

Tape type	Total time length		
	SP	LP	EP
T-60 or shorter	60	120	180
from T-80 to T-140	120	240	360
T-160 or longer	160	320	480

- If you move the pointer (▽) on the bar indication during search, the VCR searches for the new reset point.
- With the bar indication on, the ▶▶ ⊖ FF/➡ and ◀◀ ⊕ REW/⬅ buttons on the remote commander work only for moving the pointer (▽), while the ▶▶ ⊖ FF and ◀◀ ⊕ REW (or, ▶▶ FF and ◀◀ REW) buttons on the VCR are used for normal tape operation. Note, however, if you press these buttons on the VCR, searching is canceled.

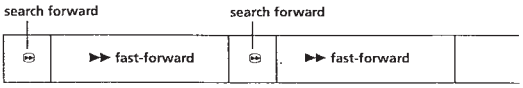
Skip-searching automatically

You can spot check a whole tape quickly. At intervals, the VCR skips playback while searching forward or backward.



Hold down ▶▶ FF (or ◀◀ REW) more than two seconds during stop. "SKIP" indicator appears on the TV screen.

The VCR searches forward (or backward) for about two minutes on the counter, then fast-forwards (or rewinds) for about ten minutes on the counter. The VCR repeats this operation until it stops at the end (or beginning) of the tape.



To cancel skip-search

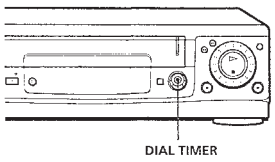
Press ▷ PLAY or ■ STOP.

Note

- The VCR automatically fast-forwards (or rewinds) any portion with no recording.

Recording TV programs using the dial timer

The Dial Timer function allows you to make timer recordings of programs without turning on your TV. Set the recording timer to record up to eight programs that will be broadcast within the next 24 hours using the DIAL TIMER. The recording start time and stop time can be set at 15 minute intervals.

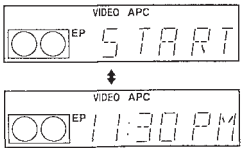


Before you start...

- Check that the VCR clock is set to the correct time.
- When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.

1 Press DIAL TIMER.

"START" and the recording start time appear alternately in the display window.

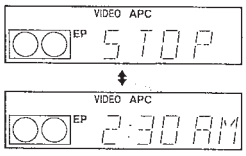


2 Turn DIAL TIMER to set the recording start time.

The time changes in 15 minute intervals.

3 Press DIAL TIMER.

"STOP" and the recording stop time appear alternately in the display window.



4 Turn DIAL TIMER to set the recording stop time.

The time changes in 15 minute intervals.

5 Press DIAL TIMER.

The channel appears in the display window.

6 Turn DIAL TIMER to set the channel.

To record from a source connected to the LINE-1 IN or LINE-2 IN jacks, press INPUT SELECT to display "L1" or "L2".

7 Press DIAL TIMER to complete the setting.

"OK" appears in the display window for about five seconds.

The ⏲ indicator appears in the display window and the VCR stands by for recording. When using a cable box, leave it on.

continued

Recording TV programs using the dial timer (continued)

To stop recording

To stop the VCR while recording, press ■ STOP.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press I/⏻. The ⏲ indicator disappears from the display window and the VCR switches on. Remember to press I/⏻ to reset the VCR to the timer recording standby mode after using the VCR.

If "CLOCK" and "12: – – AM" appear alternately when you press DIAL TIMER

Set the clock by referring to "Setting the clock" (page 25). Alternatively, you can set the clock by following the steps below. As this method automatically sets the date to the factory setting (1/1/1999), you cannot make the correct timer settings using the menu. It is suitable only for the limited use of recording a program starting within the next 24 hours using the DIAL TIMER button.

1 Turn DIAL TIMER to set the hour.

2 Press DIAL TIMER.

3 Turn DIAL TIMER to set the minutes.

4 Press DIAL TIMER to start the clock.

5 Go to step 2 on page 54.

Tips

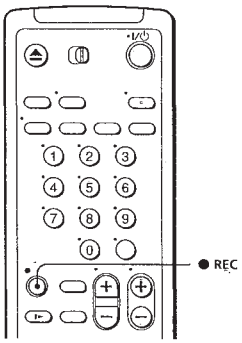
- The program is recorded in the current tape speed. To change the tape speed, press SP/EP before you complete the setting in step 7.
- To check, change, or cancel the program setting, see "Checking/changing/canceling timer settings" (page 58).

Notes

- If eight programs have already been set in step 1, "FULL" appears in the display window for about three seconds.
- The ⏲ indicator flashes in the display window when you complete the setting in step 7 with no tape inserted.
- Setting the clock using the DIAL TIMER button does not set the date. To make the timer setting using the menu, set both the time and date (page 25).

Setting the recording duration time

After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.



1 While recording, press ● REC once.

The ⏲ indicator appears in the display window.

2 Press ● REC repeatedly to set the duration.

Each press advances the time in increments of 30 minutes.

0:30 → 1:00 - - - - → 5:30 → 6:00 → Normal recording

The tape counter decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press ● REC repeatedly to set a new duration.

To cancel the duration

Press ● REC repeatedly until ⏲ indicator disappears and the VCR returns to normal recoding mode.

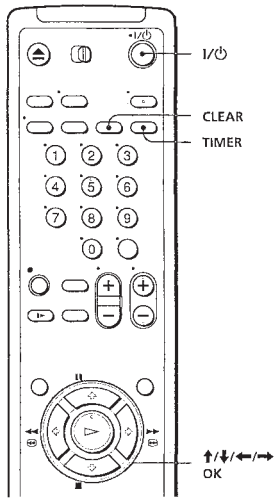
To stop while recording

Press ■ STOP.

Note

- You cannot display the current time counter in the display window when setting the recording duration.

Checking/ changing/ canceling timer settings



Before you start...

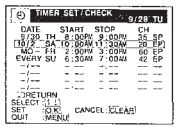
- Turn on your TV and set it to the video channel.

1 Press I/⏻ to turn on the VCR.

2 Press TIMER to display TIMER SET/CHECK.

- If you want to change a setting, go on to the next step.
- If you do not need to change the settings, press MENU, then turn off the VCR to return to recording standby.

3 Press ↑/↓ to highlight the setting you want to change or cancel.



- To change the setting, press OK and press ←/→ to highlight the item you want to change, then press ↑/↓ to reset it.
- To cancel the setting, press CLEAR.

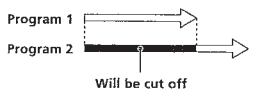
4 Press OK.

5 Press MENU to exit the menu.

If any timer settings remain, turn off the VCR to return to recording standby.

When the timer settings overlap

The program that starts first has priority and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority.



Tip

- To show the TIMER SET/CHECK menu, you can also use the MENU button. Press MENU, then press ↑/↓ to highlight TIMER SET/CHECK and press OK.

Recording stereo and bilingual programs (SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX only)

Recording stereo programs

This VCR automatically receives and records stereo programs. When a stereo program is received, the STEREO indicator lights up. If there is noise in the stereo program, set AUTO STEREO in the ADVANCED OPTIONS menu to OFF. The sound will be recorded in monaural (on both hi-fi and normal audio tracks) but with less noise. For details, see page 64.

Recording bilingual programs

Normally, this VCR records only the main sound. When a SAP (Second Audio Program) is received, the SAP indicator lights up. To record only SAP sound, set TUNER AUDIO in the ADVANCED OPTIONS menu to SAP. For details, see page 64.

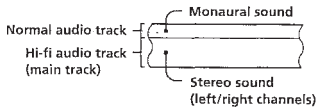
Selecting the sound during playback

Press AUDIO MONITOR to select the sound you want. (The sound being recorded will not change.)

To listen to	On-screen display	Display window
Stereo	STEREO	STEREO
Left channel	L	STEREO
Right channel	R	STEREO
Monaural sound on the normal audio track	No indicator	No indicator

How sound is recorded on a video tape

The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.



Notes

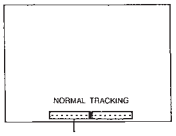
- To play a tape in stereo, you must use the A/V connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the ▨ indicator flashes in the display window, then goes off), distortion may occur if the tape was recorded in poor condition. In this case, manually adjust the tracking.

Press TRACKING +/– to display the tracking meter. The distortion should disappear as you press one of the two buttons (the ▨ indicator lights up). To resume automatic tracking adjustment, eject the tape and reinsert it.



Tracking meter

About the Adaptive Picture Control (APC) function

The Adaptive Picture Control (APC) function automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON in the ADVANCED OPTIONS menu (with the APC indicator in the display window lit). For details, see page 64.

APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

APC recording

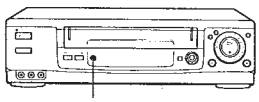
Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

Notes

- Auto tracking adjustment cannot be guaranteed to work with tapes recorded in LP mode on other VCRs.
- The APC function does not work if the tape speed is automatically changed from the SP to EP mode during a timer recording when AUTO TAPE SPEED to ON in the ADVANCED OPTIONS menu, unless the tape has been recorded in the EP mode with the APC function.
- There is a delay of about ten seconds before the VCR actually starts recording while the VCR analyzes the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press ● REC to have the VCR analyze the tape (the APC indicator flashes rapidliy). After the APC indicator stops flashing, press ❚❚ PAUSE to start recording immediately.
  If you want to start recording quickly without using the APC function, first set the VCR to recording pause (the APC indicator flashes slowly) and press ❚❚ PAUSE to start recording.

About the Reality Regenerator function (SLV-L52 PA/PC, L72HF PA/PC and L89HF CL/CS/MX/VZ only)

The Reality Regenerator function automatically restores the picture to its original quality during playback.



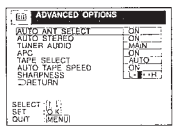
REALITY REGENERATOR

To use the Reality Regenerator function, press REALITY REGENERATOR. The REALITY REGENERATOR button lights up.

To turn it off, press REALITY REGENERATOR. The REALITY REGENERATOR button goes off.

Changing menu options

1 Press MENU, then select ADVANCED OPTIONS and press OK.



2 Press ↑/↓ to highlight the option to change, then press OK.

3 Press ↑/↓ to change the setting, then press OK.
To adjust SHARPNESS, press ←/→ and press OK.

4 Press MENU to return to the original screen.

Menu choices

Initial settings are indicated in bold print.

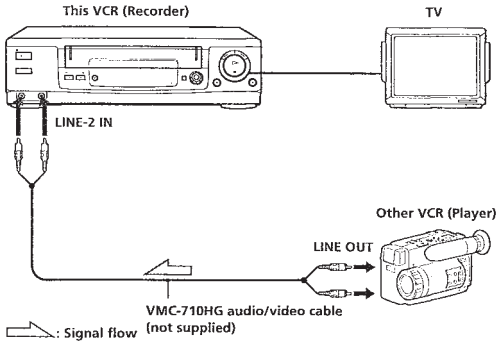
Menu option	Set this option to
AUTO ANT SELECT	• **ON** if your TV is connected only to VHF/UHF OUT on the VCR. To play a tape, set the TV to the VCR channel (channel 3 or 4). • OFF if your TV is connected to both VHF/UHF OUT and LINE OUT on the VCR. To play a tape, set the TV to the VCR input.
AUTO STEREO*	• **ON** to receive stereo programs. • OFF to reduce noise. The sound changes to monaural.
TUNER AUDIO*	• **MAIN** to record the main sound on both hi-fi and normal audio tracks. • SAP to record the SAP (Second Audio Program) sound on both hi-fi and normal audio tracks.
APC	• **ON** to switch on the APC (Adaptive Picture Control) function and improve picture quality. • OFF to switch off APC.
TAPE SELECT	• **AUTO** when using a T-160 length tape or any tape shorter than a T-140 length tape. • 180 when using a T-140 or T-180 length tape.
AUTO TAPE SPEED	• **ON** to change the timer recording tape speed automatically to the EP mode when the remaining tape length becomes shorter than the recording time. To operate AUTO TAPE SPEED, set TAPE SELECT correctly. • OFF to keep the tape speed.
SHARPNESS	L (Low) through H (High) to adjust the sharpness of the picture. L to turn off the sharpness control.

* SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX only

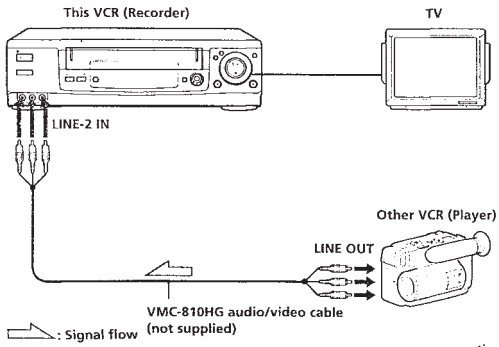
Editing with another VCR

How to hook up to record on this VCR

SLV-L49 MX, L52 PA/PC, L59 CL/CS/PR/VZ and X55 MX



SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX



continued

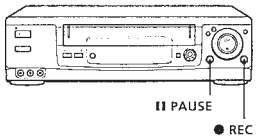
Notes

- Make sure you connect the plugs to jacks of the same color.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.
- You can use the LINE-1 IN jacks for editing.
- If the other VCR is a monaural type and connected to this VCR's LINE-2 IN jacks, connect the audio plug to the AUDIO L (white) jack. The sound is recorded on both right and left channels. When connecting to the AUDIO R (red) jack, the sound is recorded only on the right channel (SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX only).
- If the other VCR is a monaural type and connected to this VCR's LINE-1 IN jacks, the sound is recorded only on the channel whose jack is connected to the audio plug. To record on both right and left channels, connect the audio plugs to the AUDIO R/L jacks using a VMC-910HG audio/video cable (not supplied) (SLV-L69HF MX, L72HF PA/PC, L79HF CL/CS/PR/VZ, L89HF CL/CS/MX/VZ and X66HF MX only).

Operation (when recording on this VCR)

Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" (or "L1") in the display window.
- Press SP/EP to select the tape speed, SP or EP.



1. Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.
2. Insert a tape into this (recording) VCR. Search for the point to start recording and press II PAUSE.
3. Press ● REC on this VCR and set it to recording pause.
4. To start editing, press the II PAUSE buttons on both VCRs at the same time.

To stop editing

Press the ■ STOP buttons on both VCRs.

Tip

- To cut out unwanted scenes while editing, press II PAUSE on this VCR when an unwanted scene begins. When it ends, press II PAUSE again to resume recording.

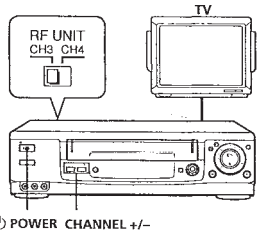
Note

- If you start recording following the procedure above, the VCR won't start recording with the APC function. To record a tape with the APC function, press ● REC again during recording pause in step 3 so that the VCR analyzes the tape. Then when you start recording in step 4, press II PAUSE immediately after the APC indicator stops flashing. If you press II PAUSE before the APC indicator stops flashing, the APC function is canceled.

General setup information

Setting the RF unit

When connecting the VCR to the TV using only the antenna cable, you must set the RF UNIT switch on the rear of the VCR so that the TV can receive the correct signal from the VCR.



1. Set the RF UNIT switch on the rear of the VCR to CH3 or CH4, whichever channel is not used in your area. If both are used, set the switch to either channel.
2. Press I/⏻ POWER to turn on the VCR.
3. Press TV/VIDEO to turn on the VIDEO indicator in the VCR's display window.
4. Press CHANNEL +/– to display a channel number in the display window. Select an active channel number in your area.
5. Turn on your TV and set it to the channel you selected in step 1 (channel 3 or 4).

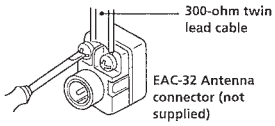
   The channel you selected in step 4 appears on the TV screen. If the channels change when you press CHANNEL +/–, you have made the correct setting.

   Whenever you use the VCR, set the TV to the channel selected in step 1.

continued

Attaching the external antenna connector

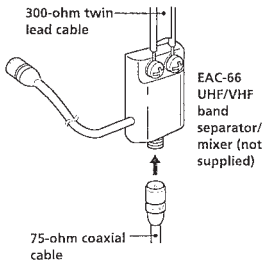
When using a 300-ohm twin lead cable for VHF/UHF antenna, use the EAC-32 antenna connector (not supplied) to connect the antenna to the VCR.



1. Loosen the screws on the antenna connector.
2. Wind the twin leads around the screws on the antenna connector.
3. Retighten the screws.

Attaching a UHF/VHF band mixer

When using both 75-ohm coaxial cable and 300-ohm twin lead cable for VHF/UHF antenna, use the EAC-66 UHF/VHF band separator/mixer (not supplied) to connect the antenna to the VCR.



1. Loosen the screws on the mixer.
2. Wind the twin leads around the screws on the mixer.
3. Retighten the screws.
4. Connect the 75-ohm coaxial cable to the mixer.

Troubleshooting

If you have any questions or problems not covered below, please consult your nearest Sony dealer.

	Symptom	Remedy
Power	The I/⏻ switch does not function.	• Connect the AC power cord securely. • Make sure the VCR is not locked. To unlock, hold down I/⏻ POWER on the VCR until the ⊶ indicator disappears.
	The power is turned on but the VCR does not operate.	• Moisture condensation occurs. Turn the power off, unplug the AC power cord and leave the VCR to dry for over three hours.
Clock	The clock has stopped and "–:– –" lights in the display window.	• The clock stops if the VCR is disconnected from the wall outlet for more than eight hours. Reset the clock (and the timer).
Playback	The playback picture does not appear on the TV screen.	• Make sure the TV is set to the channel for the VCR. If you are using a monitor, set it to video input.
	The picture is not clear.	• Adjust the tracking with the TRACKING +/– buttons. • The video heads are dirty (see below). Clean the video heads using the Sony T-25CLD, T-25CLDR, or T-25CLW video head cleaning cassette. If these cleaning cassettes are not available in your area, have the heads cleaned at your nearest Sony service facility (a standard service fee will be charged). Do not use a commercially available liquid-type cleaning cassette other than Sony's, as it may damage the video heads. • The video heads may have to be replaced. Consult your local Sony dealer for more information.
	The picture rolls vertically during picture search.	• Adjust the vertical hold control on the TV or monitor.
	The picture has no sound.	• The tape is defective. • If you made A/V connections, check the audio cable connection.

Symptoms caused by contaminated video heads

• Normal picture • Rough picture • Unclear picture • No picture (or black & white screen appears)

initial contamination → terminal

continued

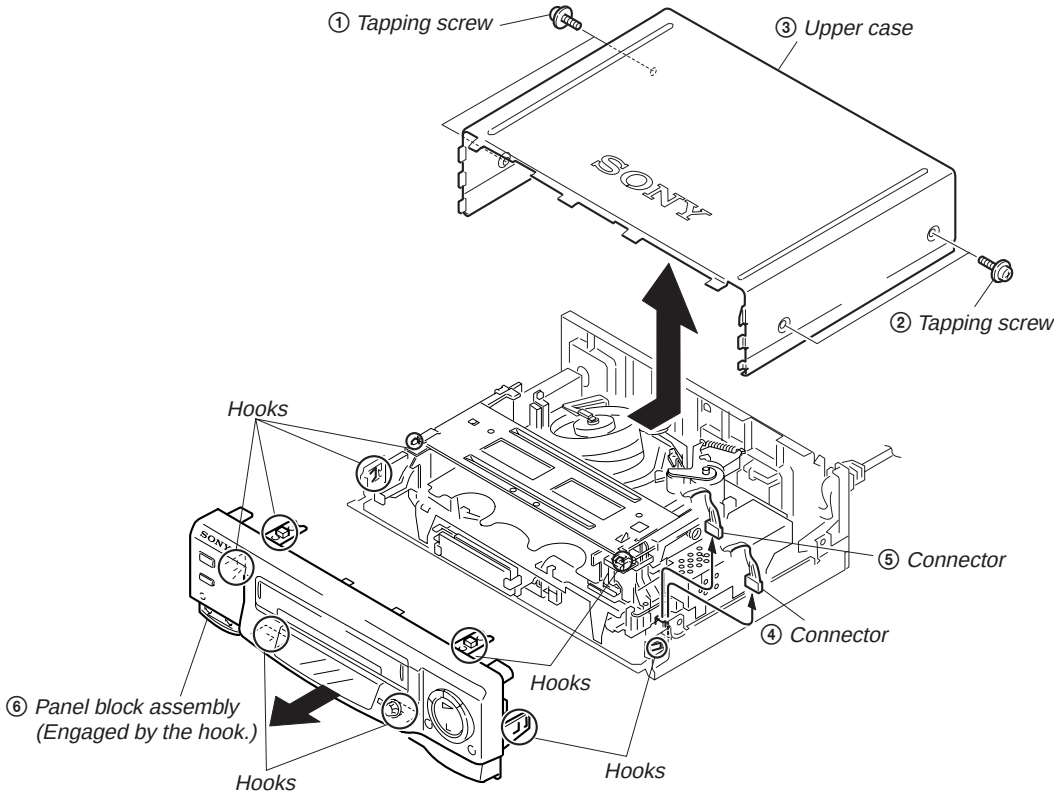
Troubleshooting (continued)

	Symptom	Remedy
Recording	A TV program does not appear on the TV screen.	• Make sure the TV is set to the channel for the VCR. If you are using a monitor, set it to video input. • Select the correct source with the INPUT SELECT button. Select a channel number when recording TV programs; select "L1" or "L2" when recording from other equipment.
	TV reception is poor.	• Adjust the TV antenna.
	The tape starts playing as soon as it is inserted.	• The safety tab has been removed. To record on this tape, cover the tab hole.
	The tape ejects when you press ● REC.	• Check that the safety tab has not been removed.
	Nothing happens when you press ● REC.	• Make sure the tape is not at its end.
Timer recording	The timer does not operate.	• Check that the clock is set. • Make sure a tape has been inserted. • Check that the safety tab has not been removed. • Make sure the tape is not at its end. • Make sure a program has been set for timer recording. • Make sure your timer settings have not already passed the current time. • Check that the cable box is turned on. • The clock stops if the VCR is disconnected from the wall outlet for more than eight hours. Reset the clock and timer.
Others	A tape cannot be inserted.	• Check that a tape is not already in the tape compartment.
	The remote commander does not function.	• Make sure you are pointing the remote commander at the remote sensor on the VCR. • Replace all the batteries in the remote commander with new ones if they are weak. • Make sure the TV / VIDEO switch is set correctly.
	The tracking meter does not appear on the screen.	• The recording condition of the tape is very poor and tracking cannot be adjusted.
	You cannot control other TVs.	• Set your TV's code number. The code number may change when you replace the batteries of the remote commander.
	The VCR needs to be cleaned.	• Clean the cabinet, panel and controls with a dry, soft cloth, or a soft cloth slightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine.

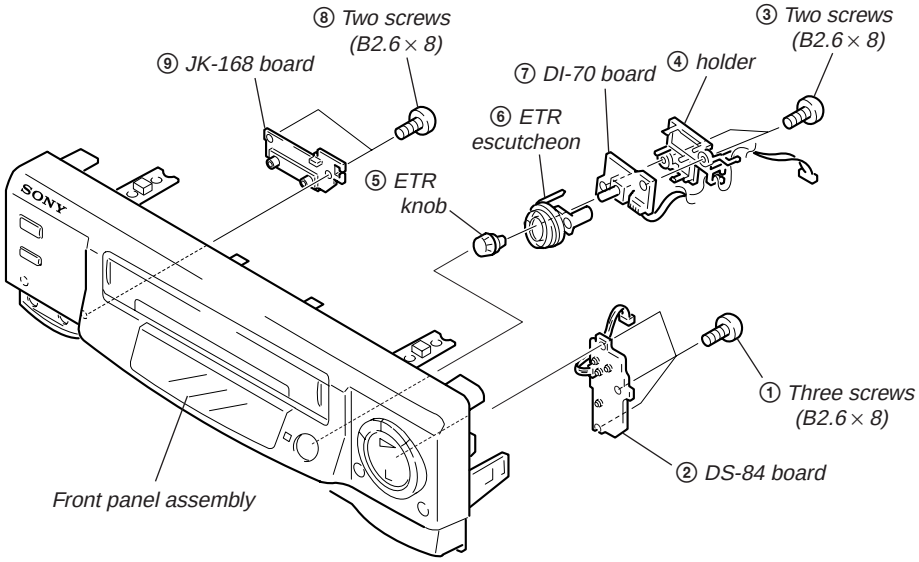
SECTION 2
DISASSEMBLY

NOTE: Follow the disassembly procedure in the numerical order given.

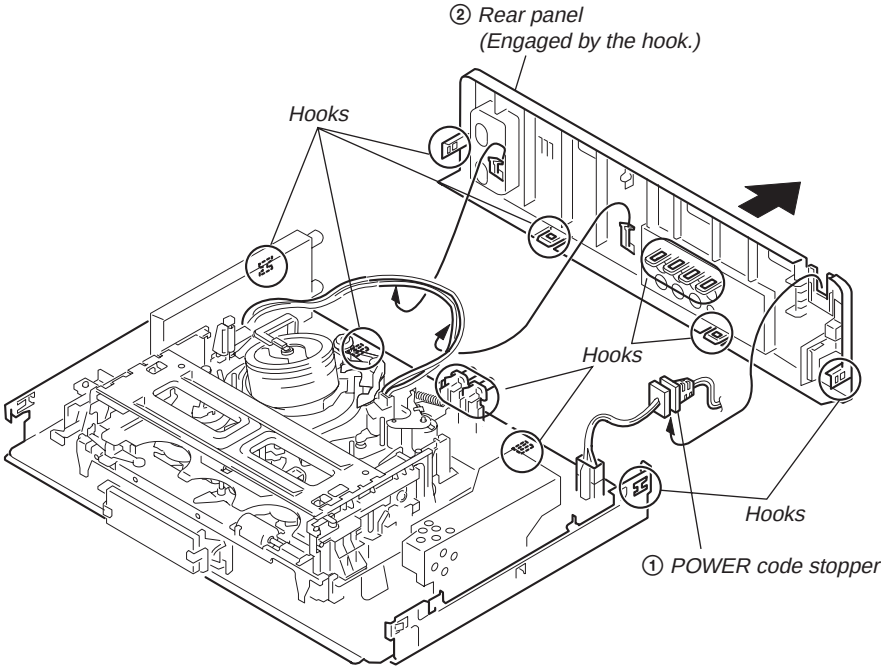
2-1. UPPER CASE, PANEL BLOCK ASSEMBLY



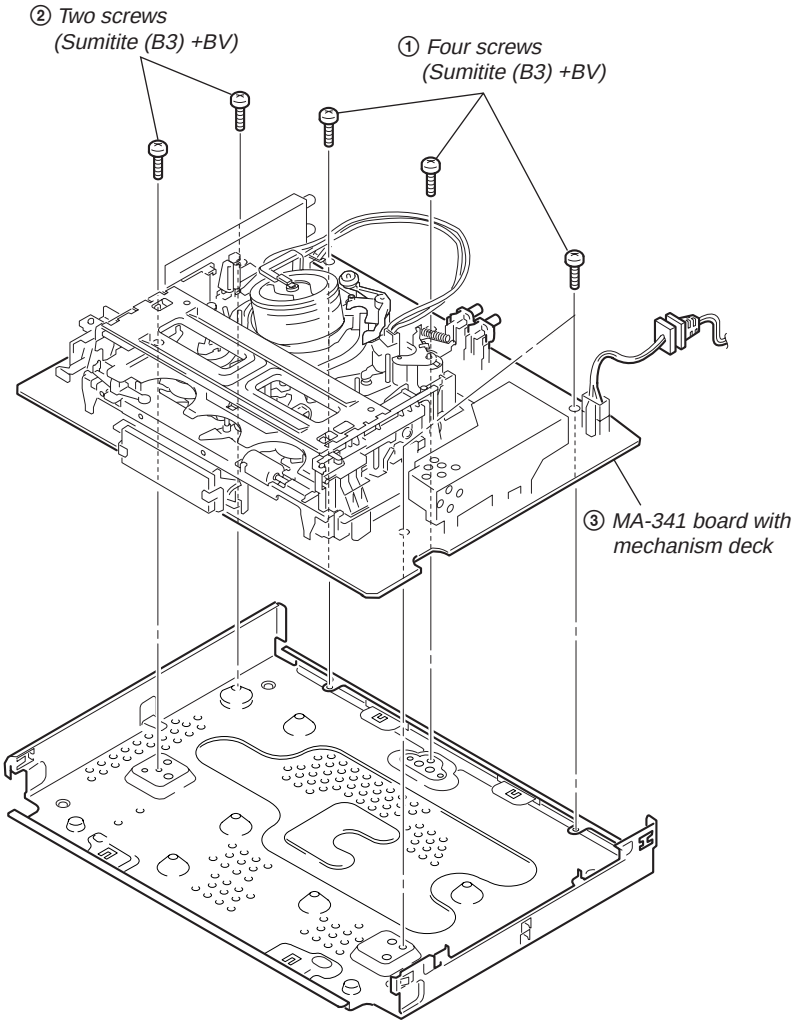
2-2. DS-84, DI-70, JK-168 BOARDS



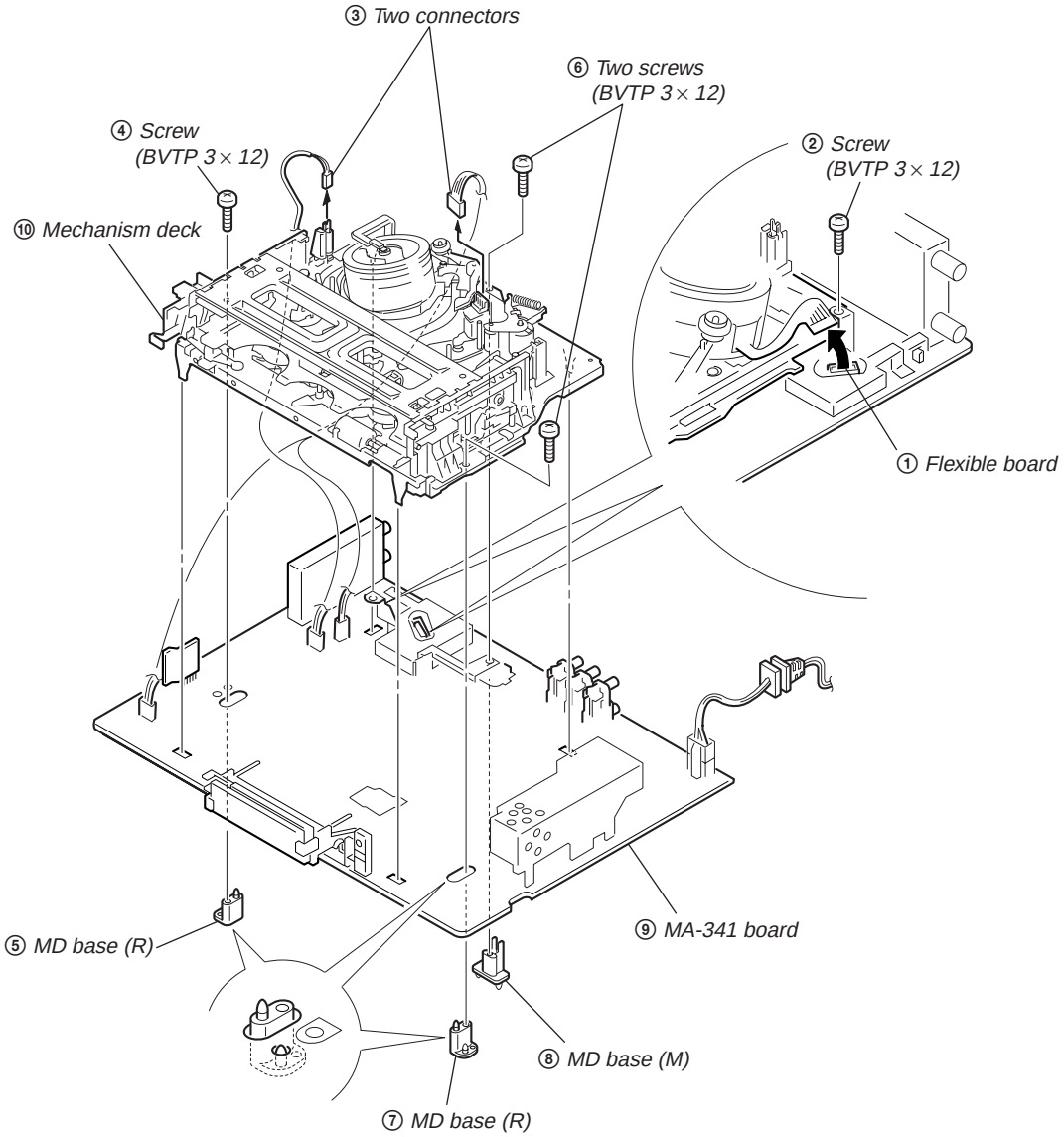
2-3. REAR PANEL



2-4. MA-341 BOARD

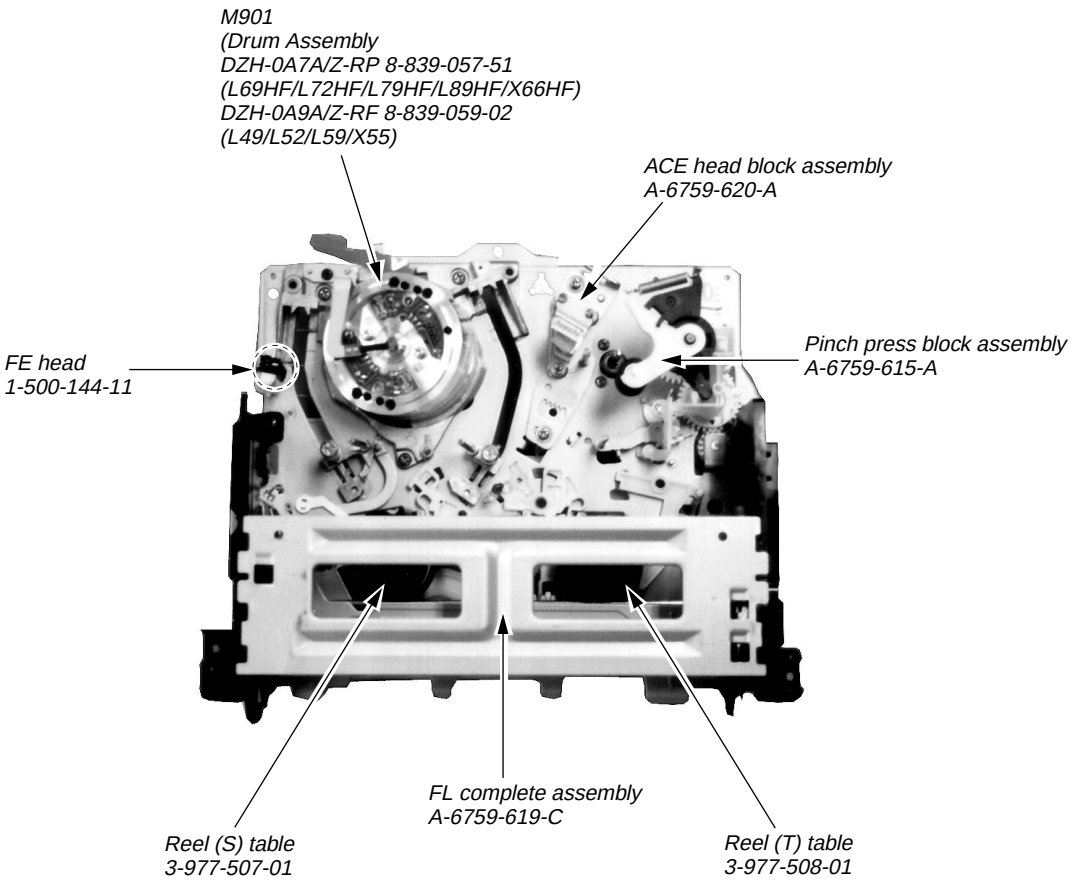


2-5. MECHANISM DECK

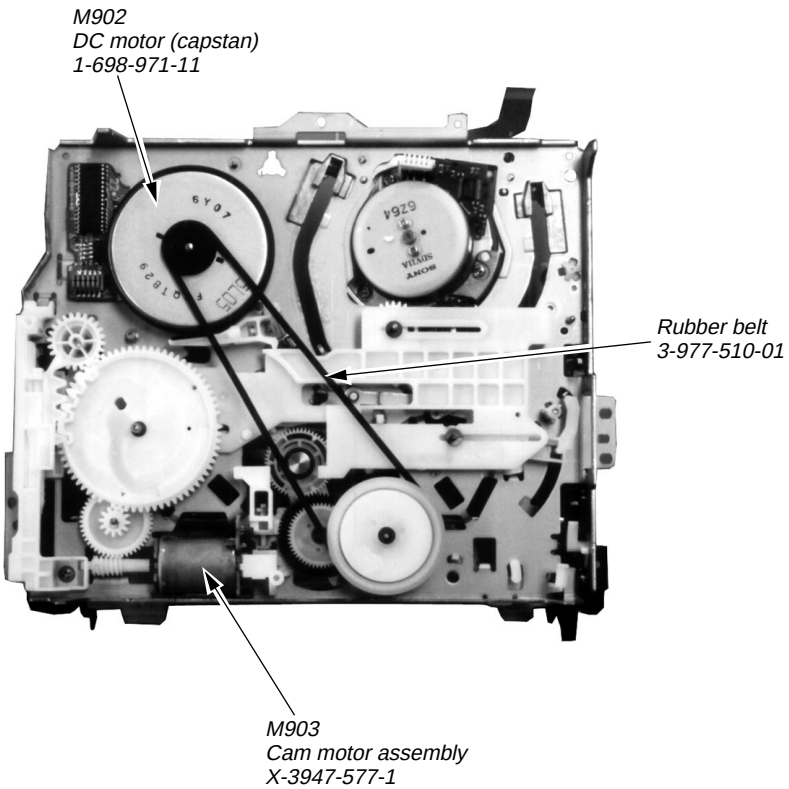


2-6. INTERNAL VIEWS

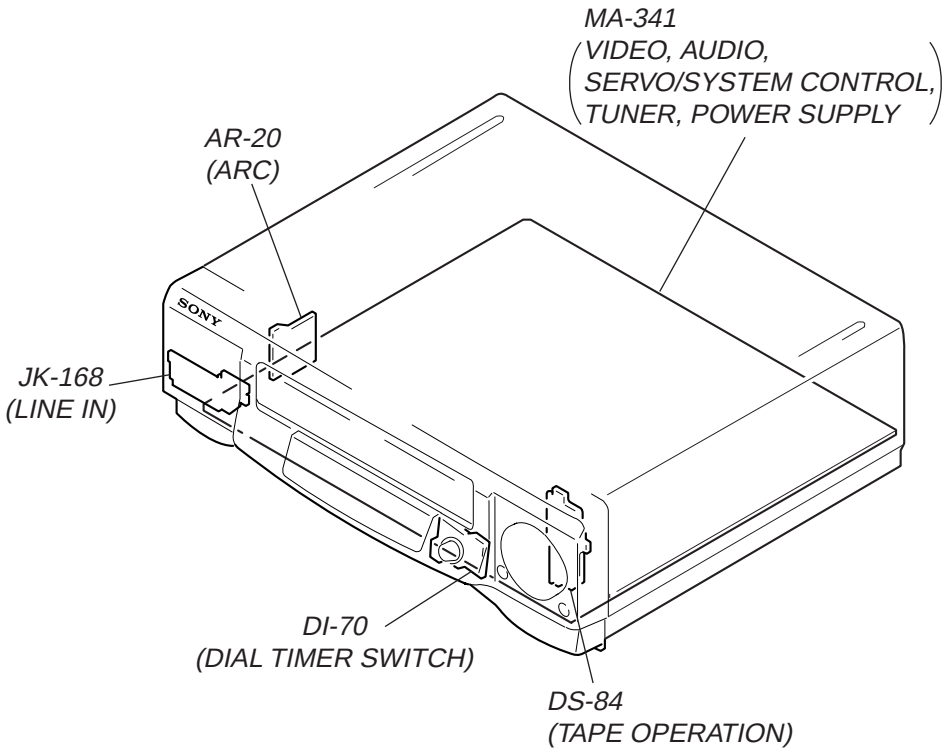
— Top View —



— Bottom View —

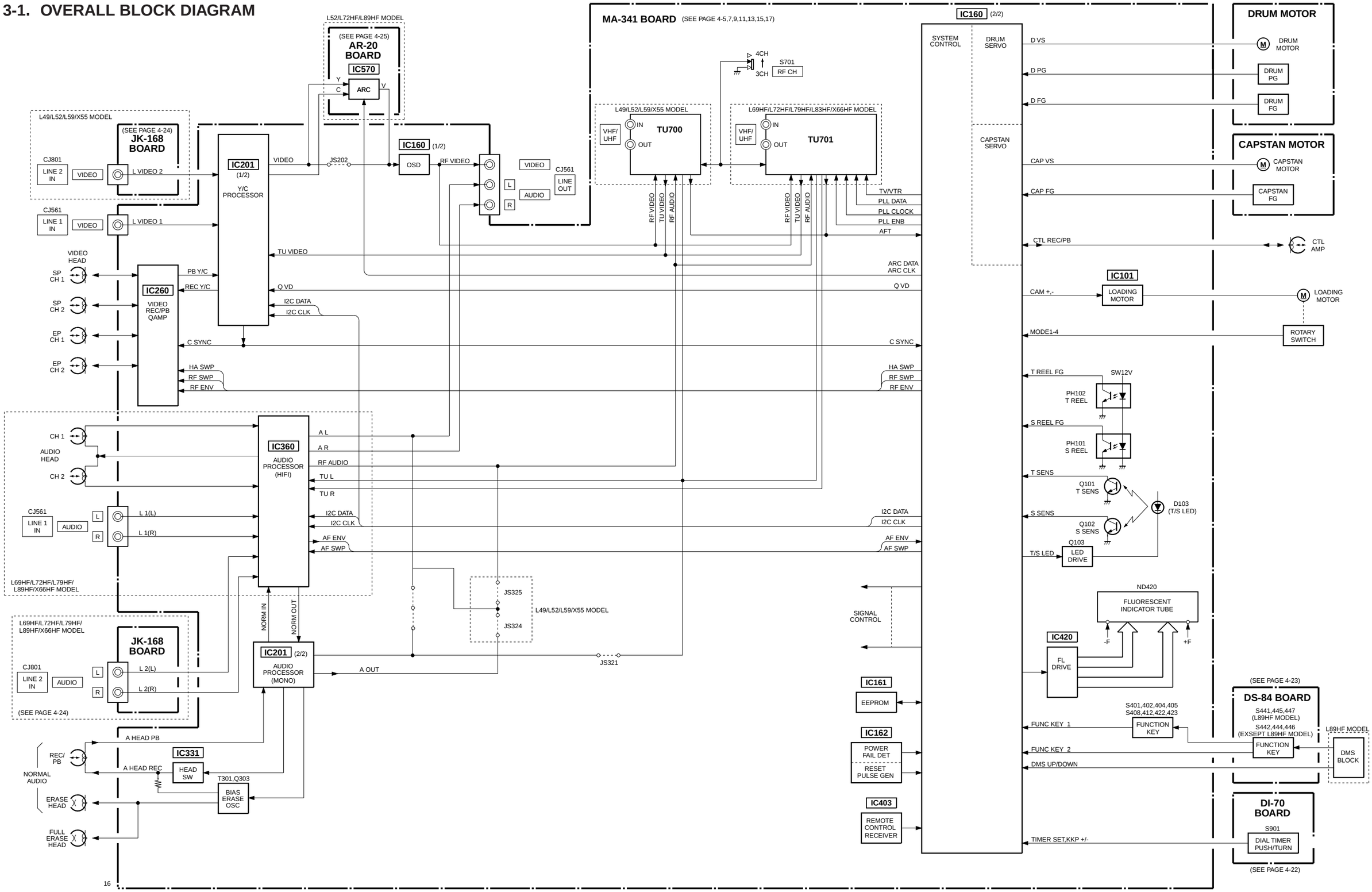


2-7. CIRCUIT BOARDS LOCATION

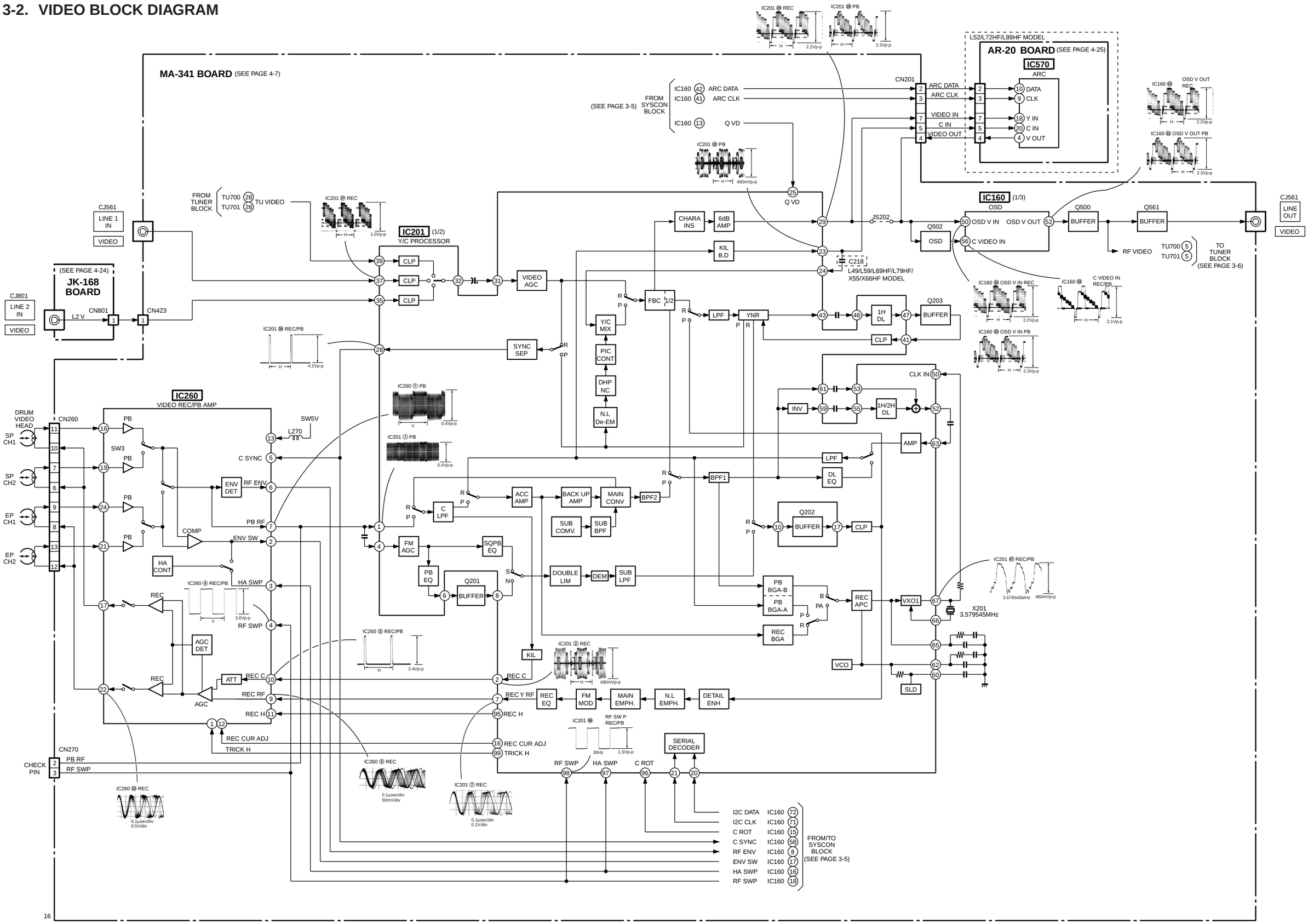


SECTION 3
BLOCK DIAGRAMS

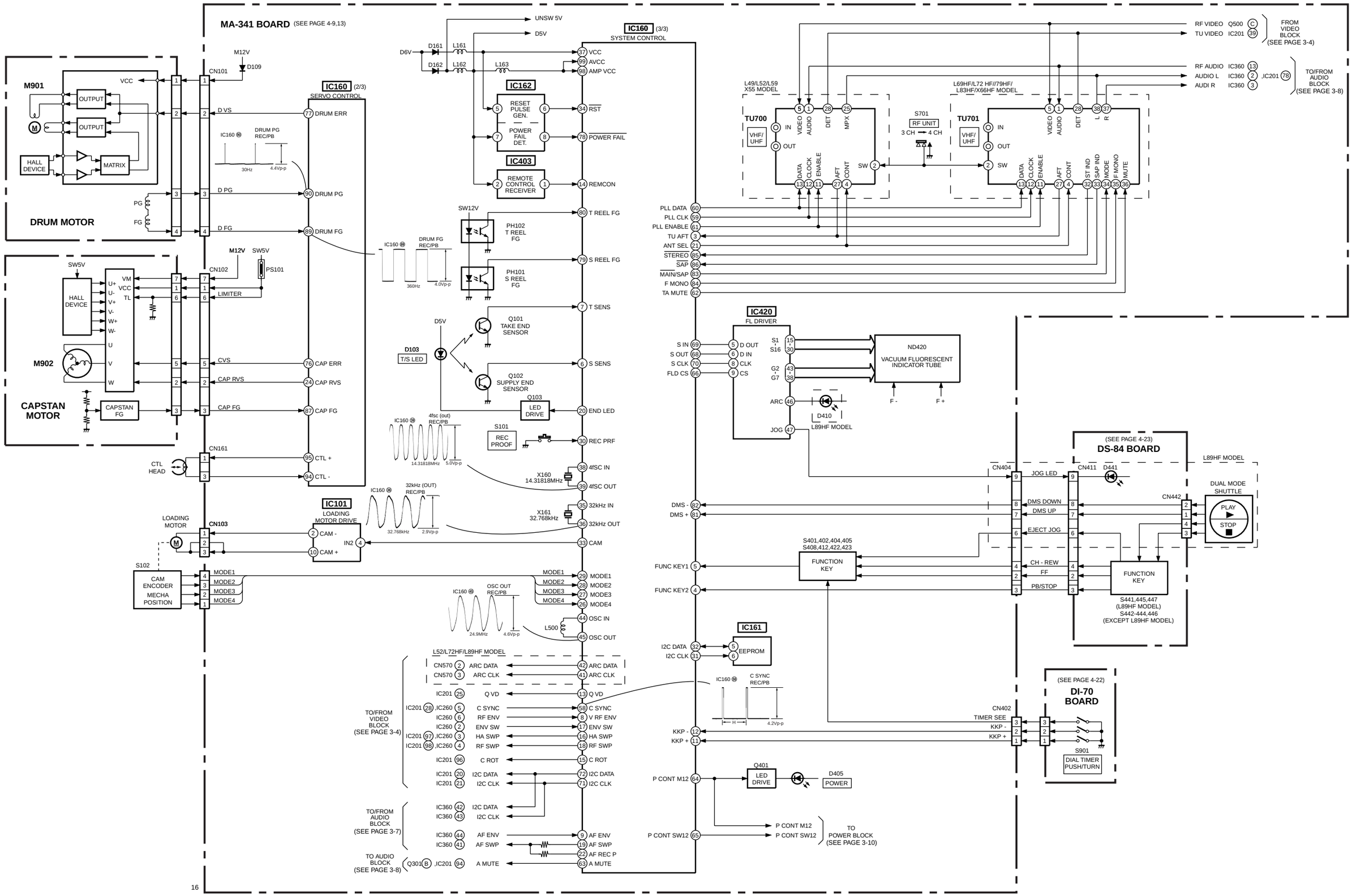
3-1. OVERALL BLOCK DIAGRAM



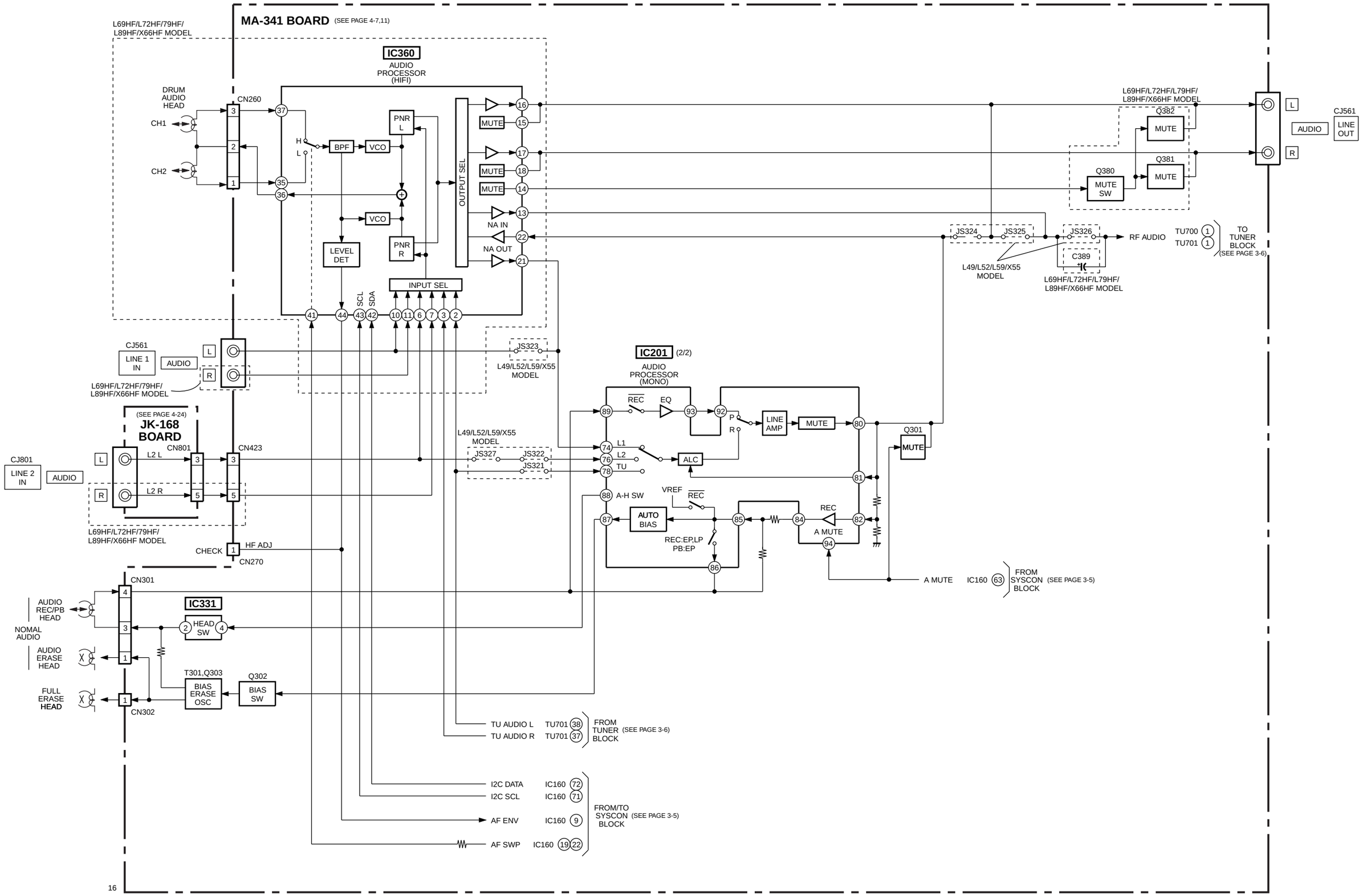
3-2. VIDEO BLOCK DIAGRAM



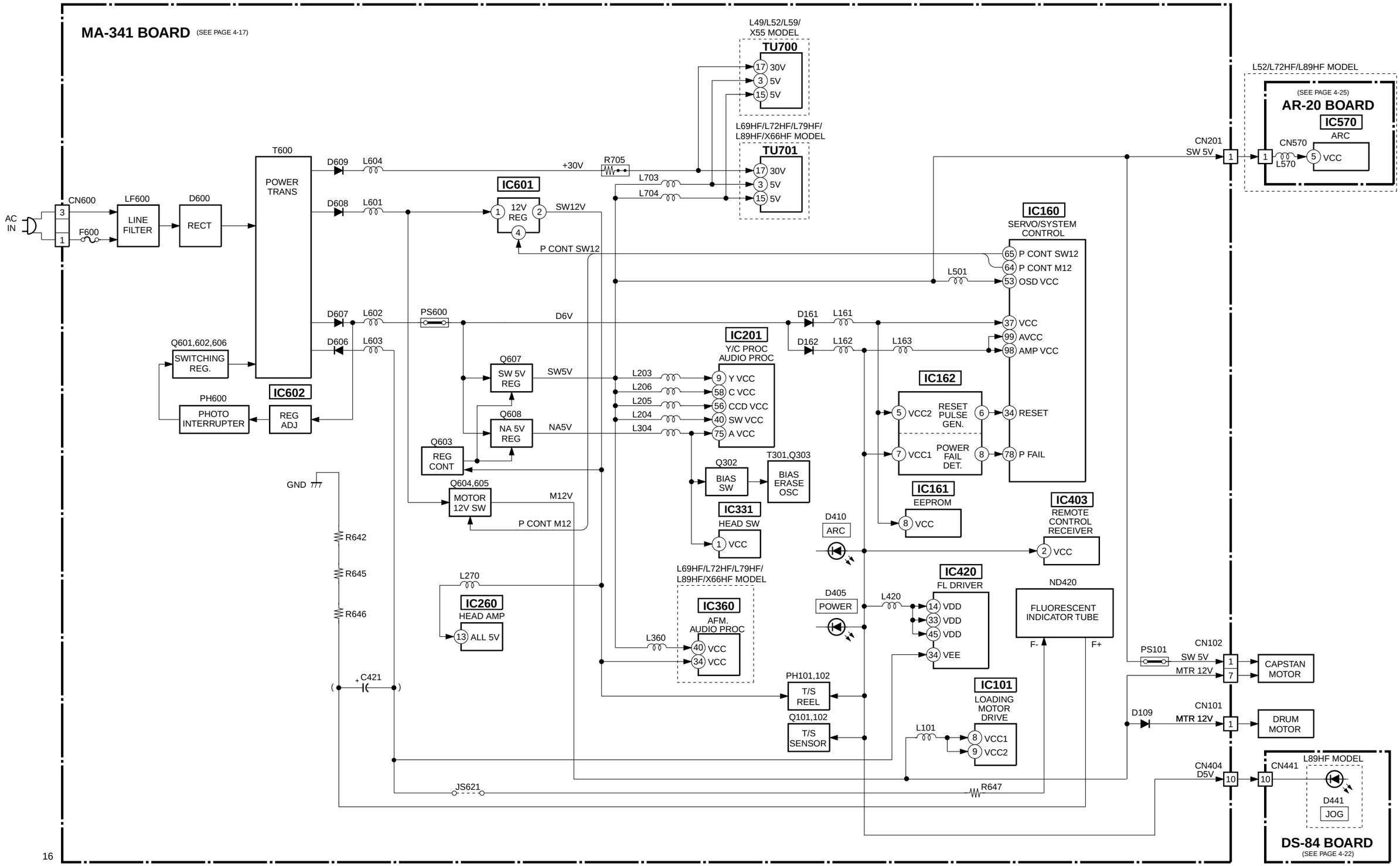
3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM



3-4. AUDIO/TUNER BLOCK DIAGRAM



3-5. POWER BLOCK DIAGRAM



SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

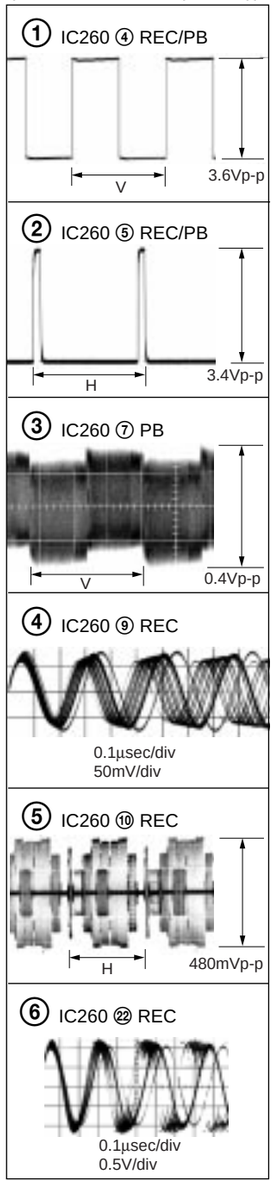
- **For Printed Wiring Boards.**
- ▒▒▒: Pattern from the side which enables seeing.

- **For Schematic Diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistor are in ohms, 1/4 W unless otherwise noted.
  Chip resistor are 1/10 W unless otherwise noted.
  kΩ: 1000 Ω, M Ω, : 1000 kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF. 50 V or less are not indicated except for electrolytics and tantalums.
- ▭: panel designation.
- △ : internal component.
- B + : B+ Line.
- B − : B– Line.
- Circled numbers refer to waveforms.
- Readings are taken with a PAL color-bar signal input.
- Voltage are dc between ground and measurement points.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

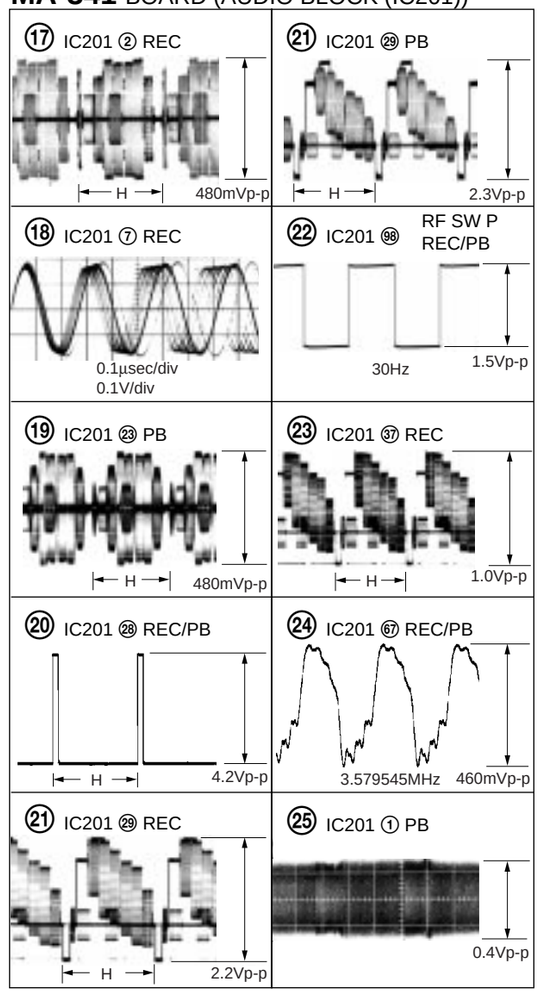
When indicating parts by reference number, please include the board name.

- Abbreviation
  MX : Mexican
  CS : Chilian, Bolivia, Peru
  PR : Puerto Rico
  VZ : Venezuelan

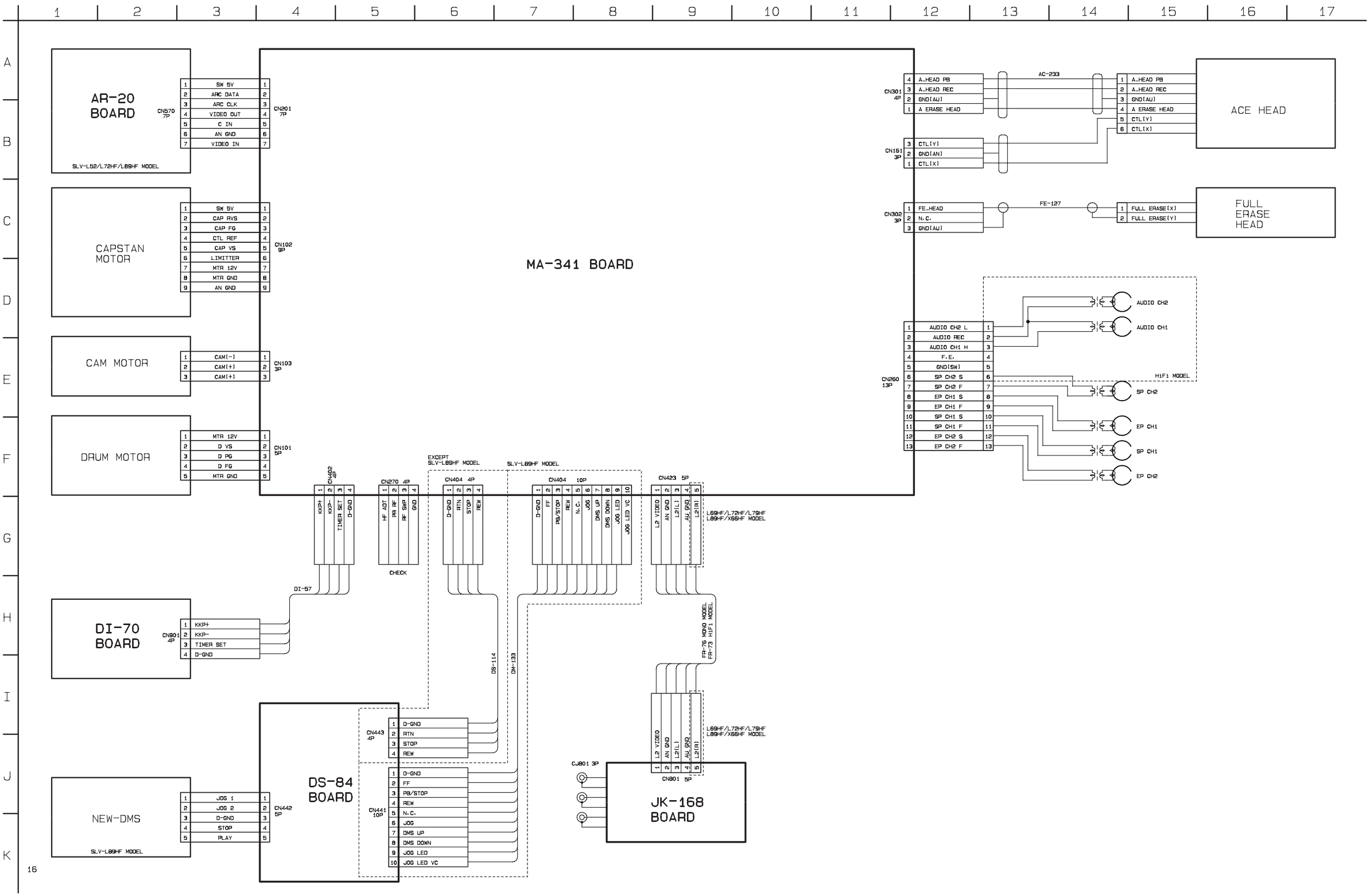
MA-341 BOARD
(VIDEO BLOCK (IC260))



MA-341 BOARD (AUDIO BLOCK (IC201))



4-1. FRAME SCHEMATIC DIAGRAM



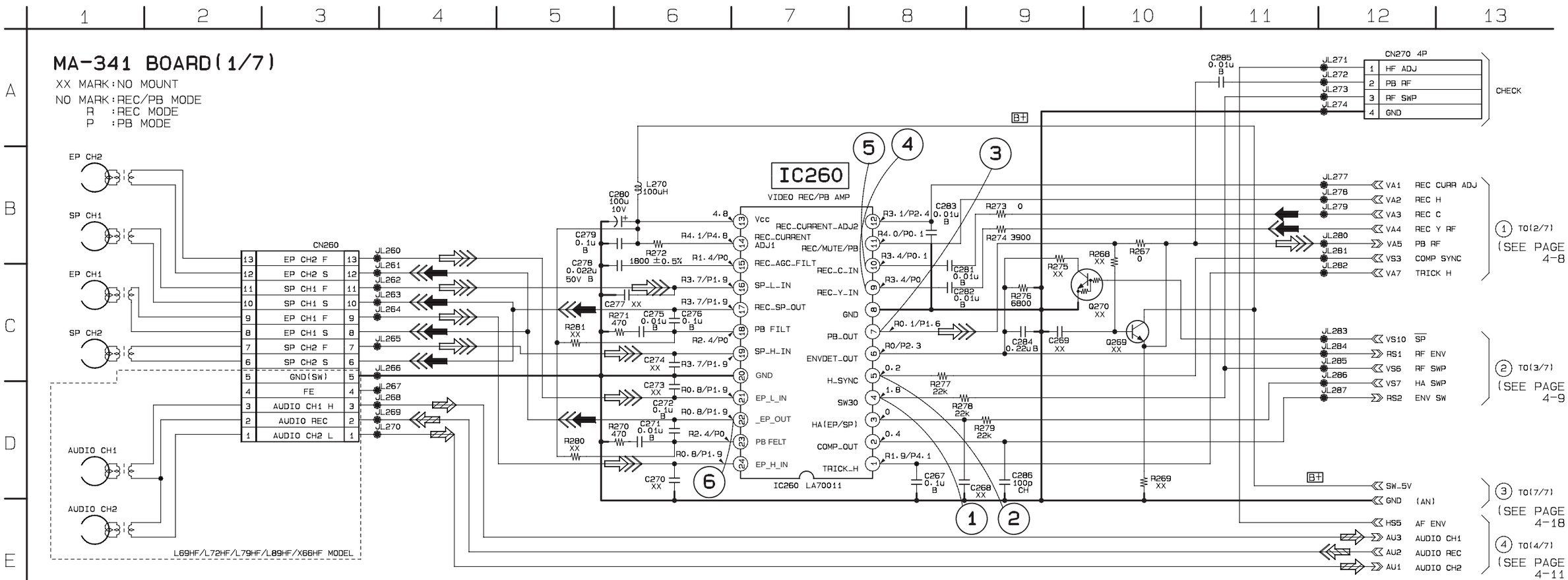
4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

MA-341 (1/7) (VIDEO) SCHEMATIC DIAGRAMS

— Ref. No. MA-341 Board; 1,000 Series —

For schematic diagram

- Refer to page 4-19 for printed wiring board.
- Refer to page 4-2 for waveforms.



•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	⇨
PB			⇨	⇨

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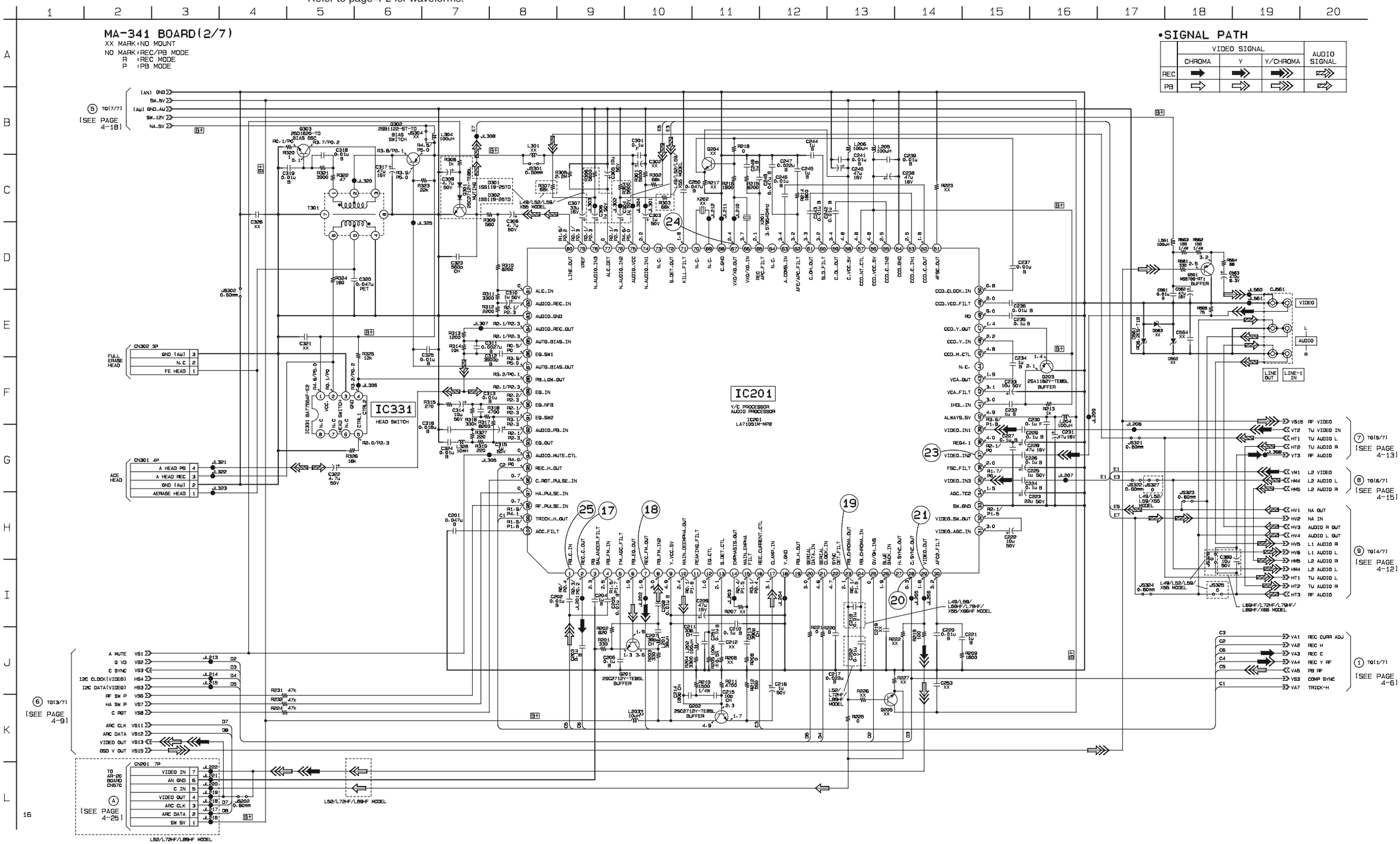
MA-341 (2/7) (AUDIO) SCHEMATIC DIAGRAMS

— Ref. No. MA-341 Board; 1,000 Series —

For schematic diagram

- Refer to page 4-19 for printed wiring board.
- Refer to page 4-2 for waveforms.

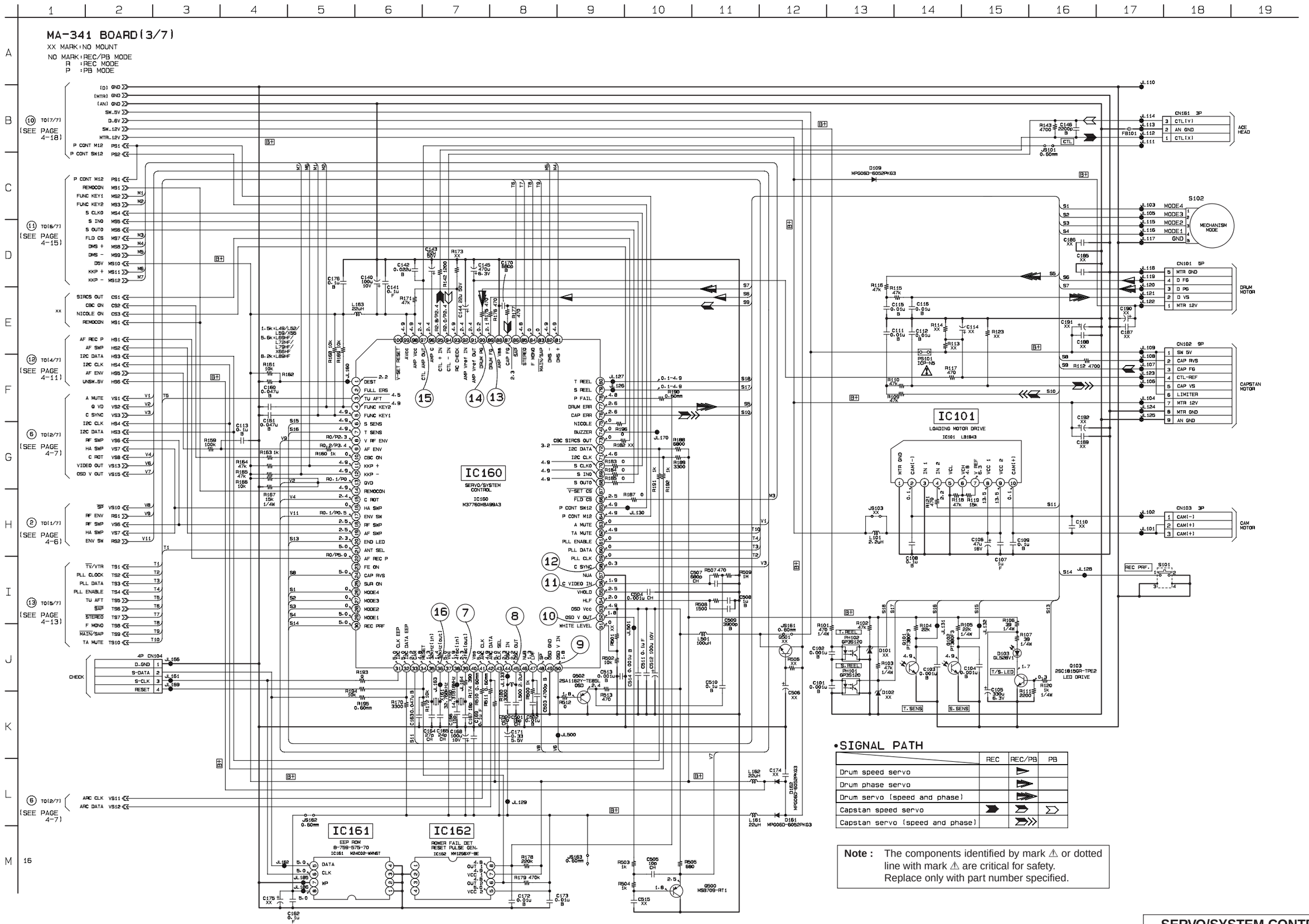


MA-341 (3/7) (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAMS

— Ref. No. MA-341 Board; 1,000 Series —

For schematic diagram

- Refer to page 4-19 for printed wiring board.
- Refer to page 4-21 for waveforms.



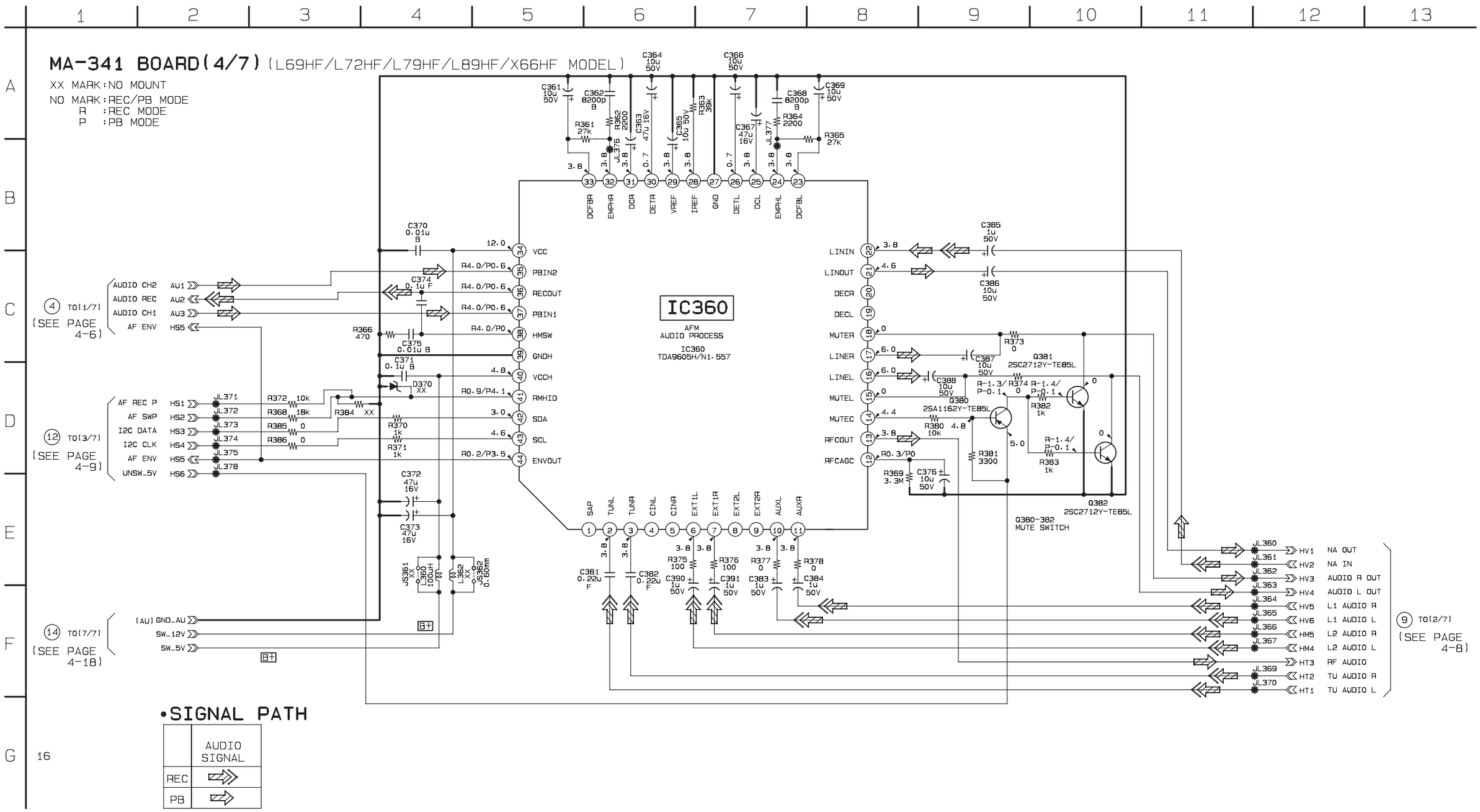
•SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo		▶	
Drum phase servo		▶▶	
Drum servo (speed and phase)		▶▶	
Capstan speed servo	▶	▶	▷
Capstan servo (speed and phase)		▶▶	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

MA-341 (4/7) (AUDIO PROCESS) SCHEMATIC DIAGRAMS
— Ref. No. MA-341 Board; 1,000 Series —

For schematic diagram
• Refer to page 4-19 for printed wiring board.

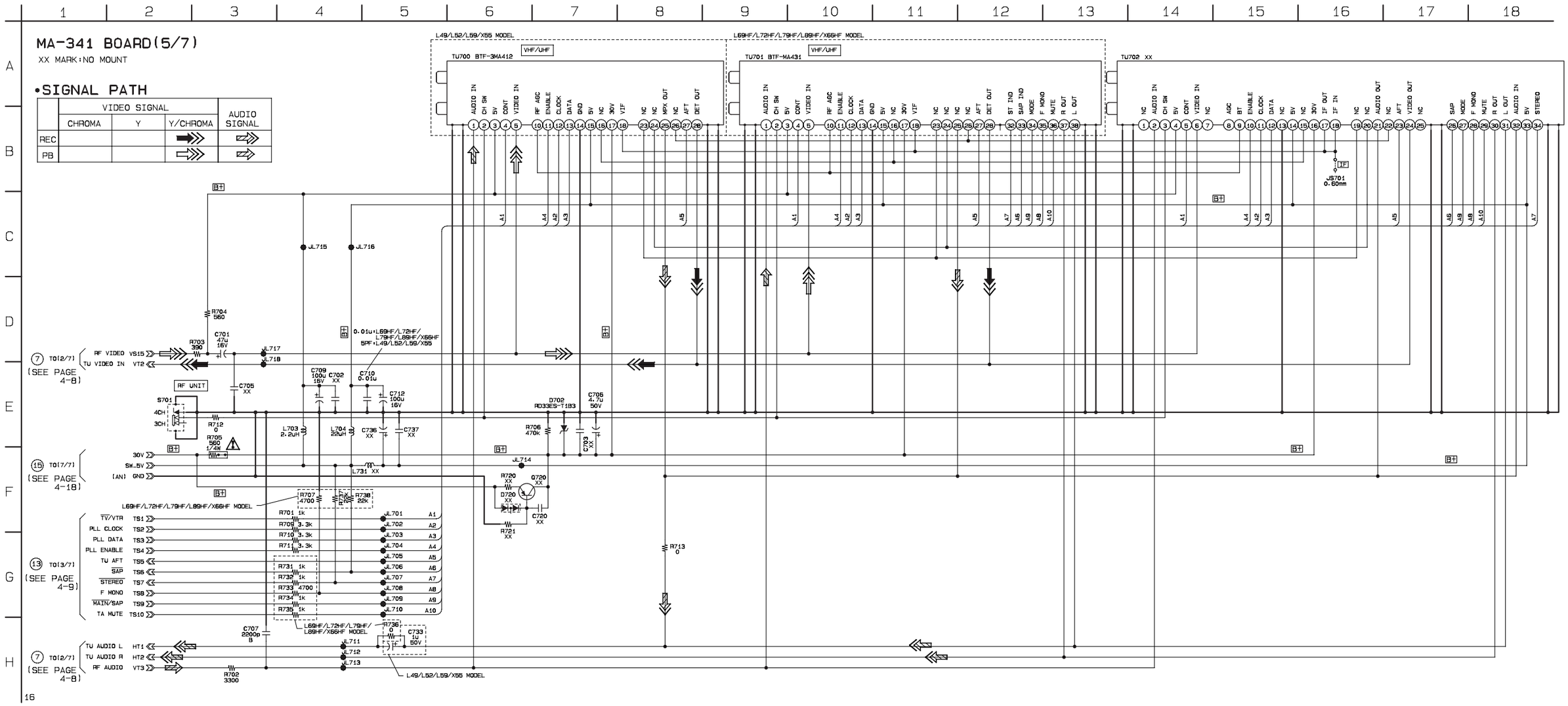


MA-341 (5/7) (TUNER) SCHEMATIC DIAGRAMS

— Ref. No. MA-341 Board; 1,000 Series —

For schematic diagram

• Refer to page 4-19 for printed wiring board.



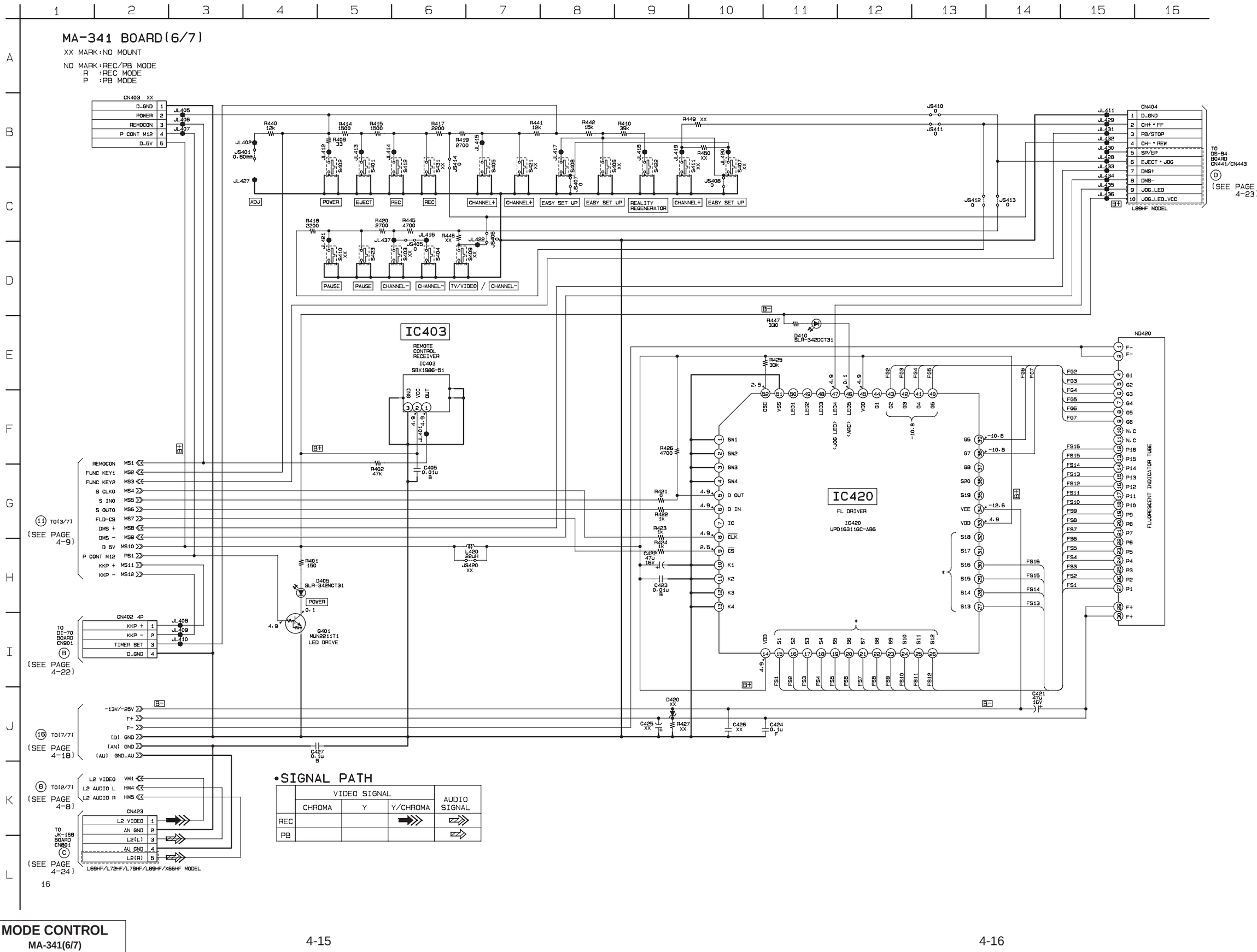
Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MA-341 (6/7) (MODE CONTROL) SCHEMATIC DIAGRAMS

— Ref. No. MA-341 Board; 1,000 Series —

For schematic diagram

• Refer to page 4-19 for printed wiring board.

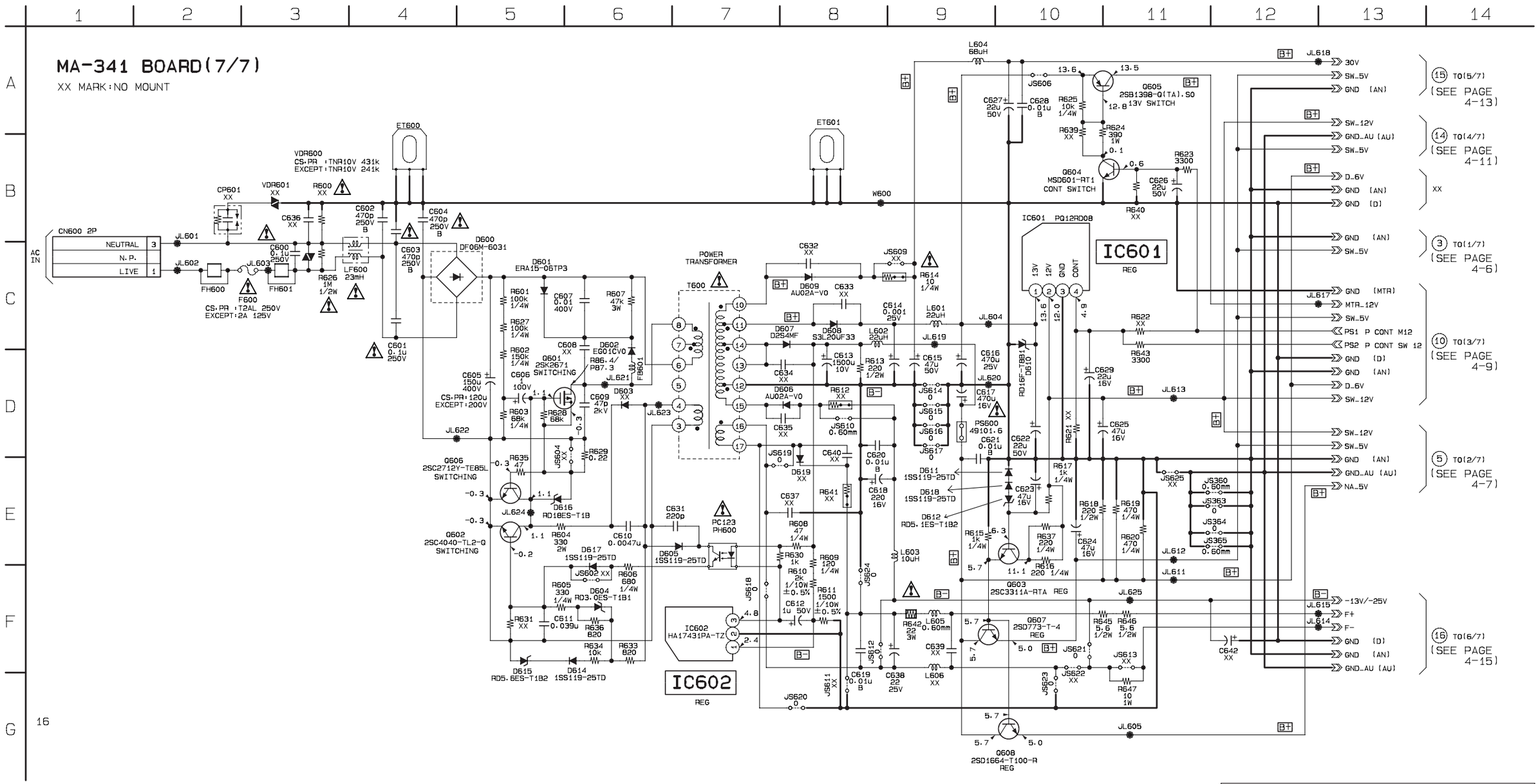


•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			⇶	⇉
PB				⇉

MA-341 (7/7) (POWER SUPPLY) SCHEMATIC DIAGRAMS
— Ref. No. MA-341 Board; 1,000 Series —

For schematic diagram
• Refer to page 4-19 for printed wiring board.

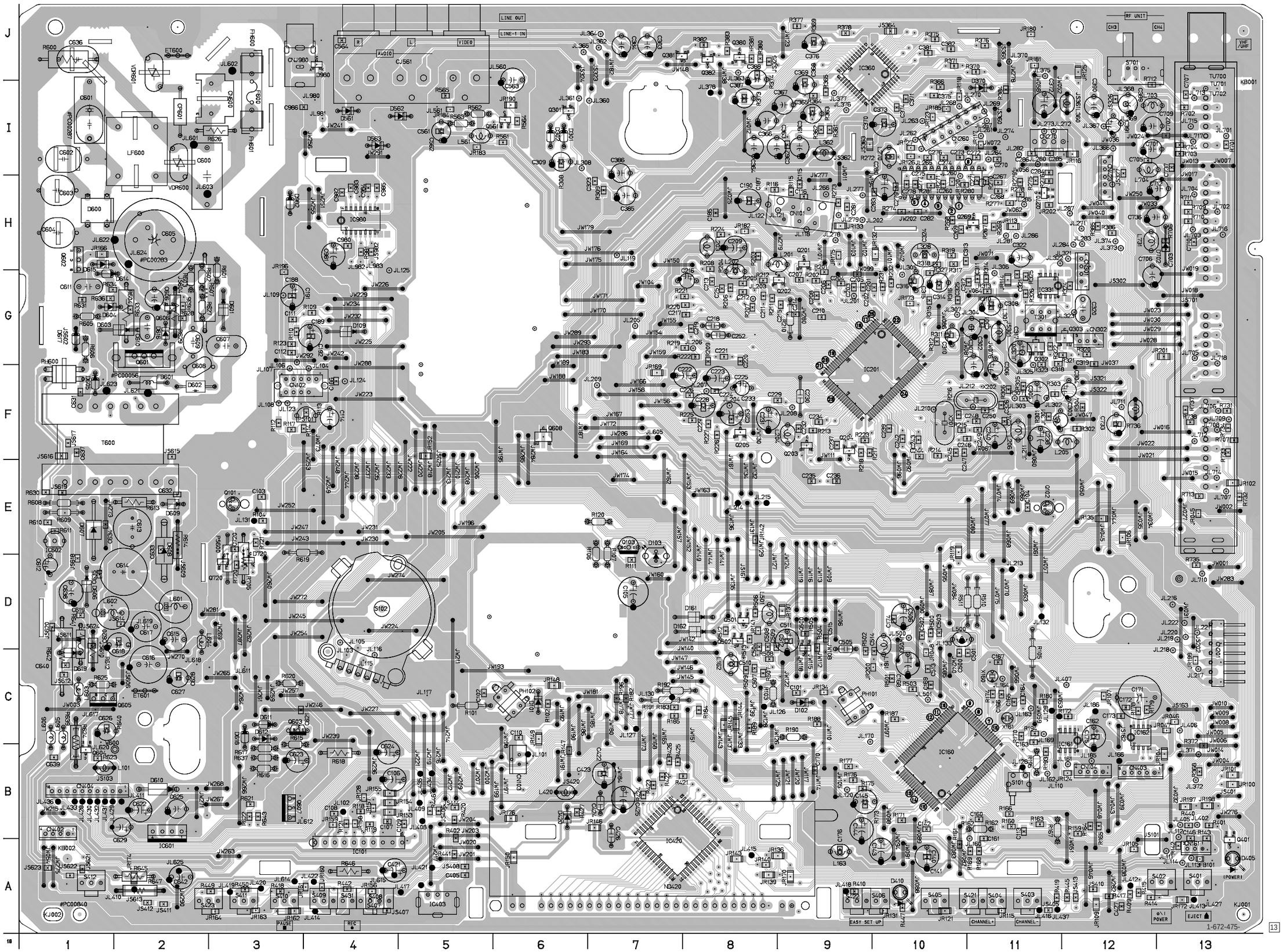


Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MA-341 (VUDEO, AUDIO, SERVO/SYSTEM CONTROL, TUNER, POWER SUPPLY) PRINTED WIRING BOARD
— Ref. No. MA-341 Board; 1,000 Series —

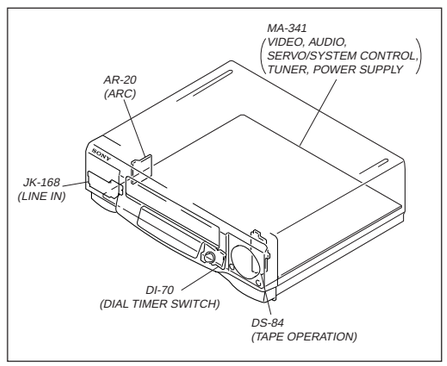
There are few cases that the part printed on this diagram isn't mounted in this model.

MA-341 BOARD

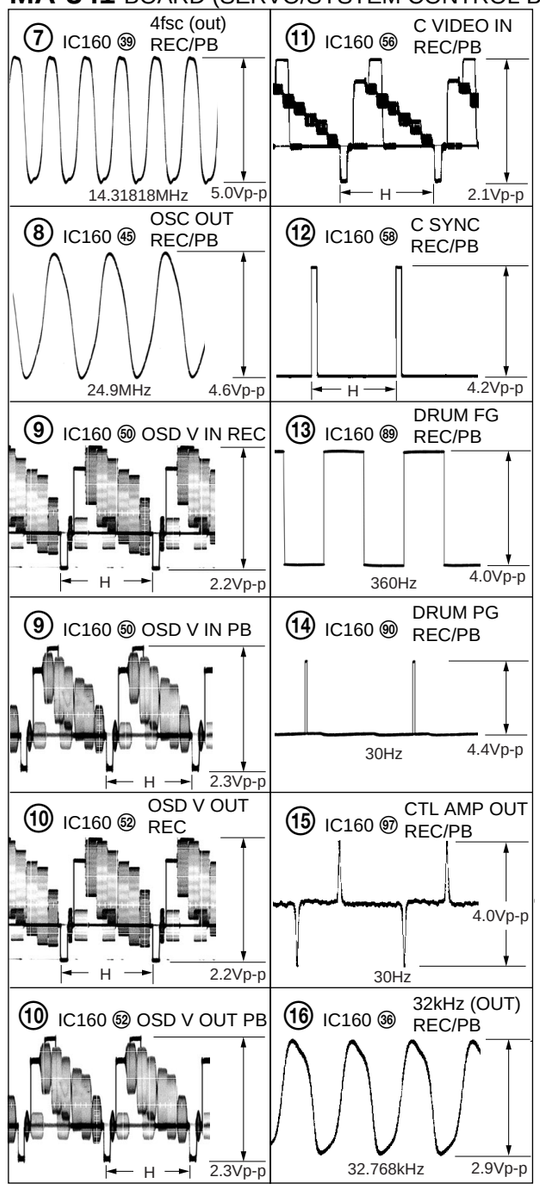


MA-341 BOARD

CN101	H-9	IC101	A-4
CN102	F-3	IC160	C-10
CN103	B-6	IC161	C-12
CN104	B-12	IC162	C-12
CN161	A-13	IC201	F-10
CN260	I-10	IC260	H-10
CN270	I-11	IC331	G-11
CN301	G-12	IC360	J-9
CN302	G-12	IC403	A-5
CN402	B-1	IC420	A-7
CN404	B-1	IC601	B-2
CN423	I-12	IC602	E-1
CN600	I-3		
		PH101	C-9
D103	D-7	PH102	C-6
D109	G-4	PH600	F-1
D161	D-8		
D162	D-8	Q101	E-3
D301	I-6	Q102	E-11
D302	I-6	Q103	E-7
D405	A-13	Q201	H-9
D410	A-10	Q202	G-8
D561	I-4	Q203	F-9
D600	H-1	Q301	I-6
D601	G-3	Q302	G-11
D602	F-2	Q303	G-12
D604	G-2	Q380	J-8
D605	F-1	Q381	J-7
D606	D-1	Q382	J-8
D607	E-1	Q401	A-13
D608	E-2	Q500	C-9
D609	E-2	Q502	C-8
D610	B-2	Q561	I-6
D611	C-3	Q601	G-2
D612	C-3	Q602	H-1
D614	G-2	Q603	C-3
D615	H-2	Q604	B-1
D616	G-2	Q605	C-1
D617	G-1	Q606	G-2
D618	C-3	Q607	B-3
D702	H-13	Q608	F-6



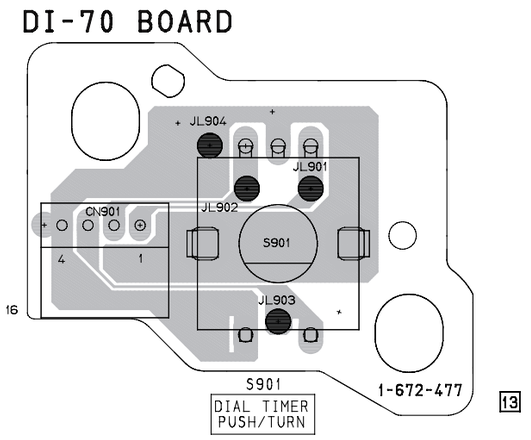
MA-341 BOARD (SERVO/SYSTEM CONTROL BLOCK)

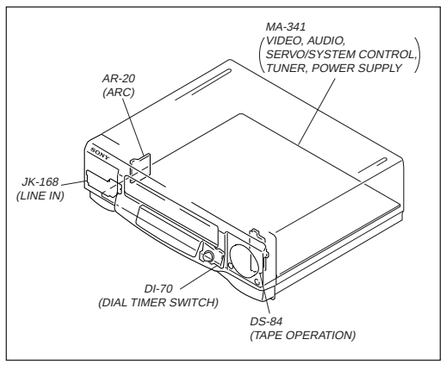


DI-70 (DIAL TIMER SWITCH) PRINTED WIRING BOARD

— Ref. No. DI-70 Board; 2,000 Series —

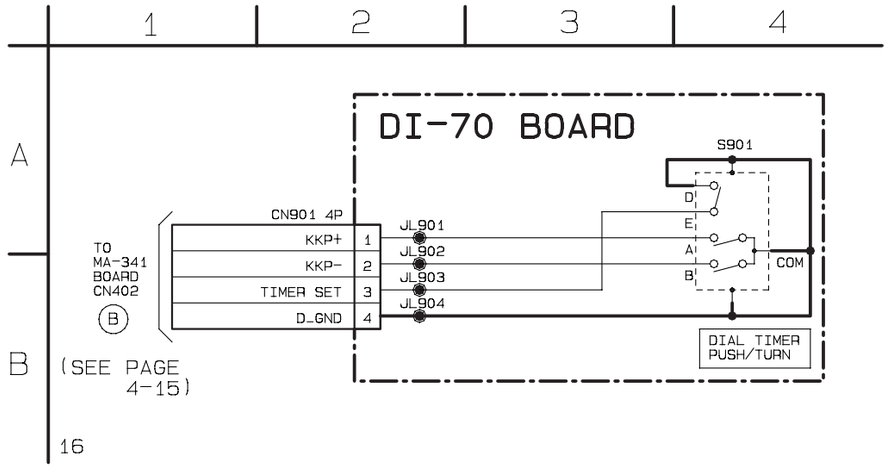
There are few cases that the part printed on this diagram isn't mounted in this model.





DI-70 (DIAL TIMER SWITCH) SCHEMATIC DIAGRAMS

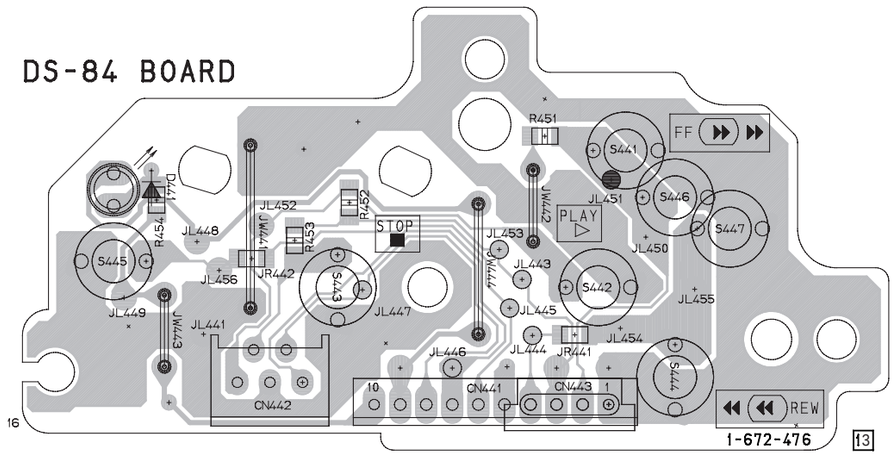
— Ref. No. DI-70 Board; 2,000 Series —

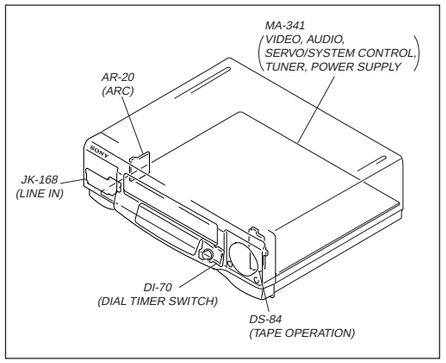


DS-84 (TAPE OPERATION) PRINTED WIRING BOARD

— Ref. No. DS-84 Board; 3,000 Series —

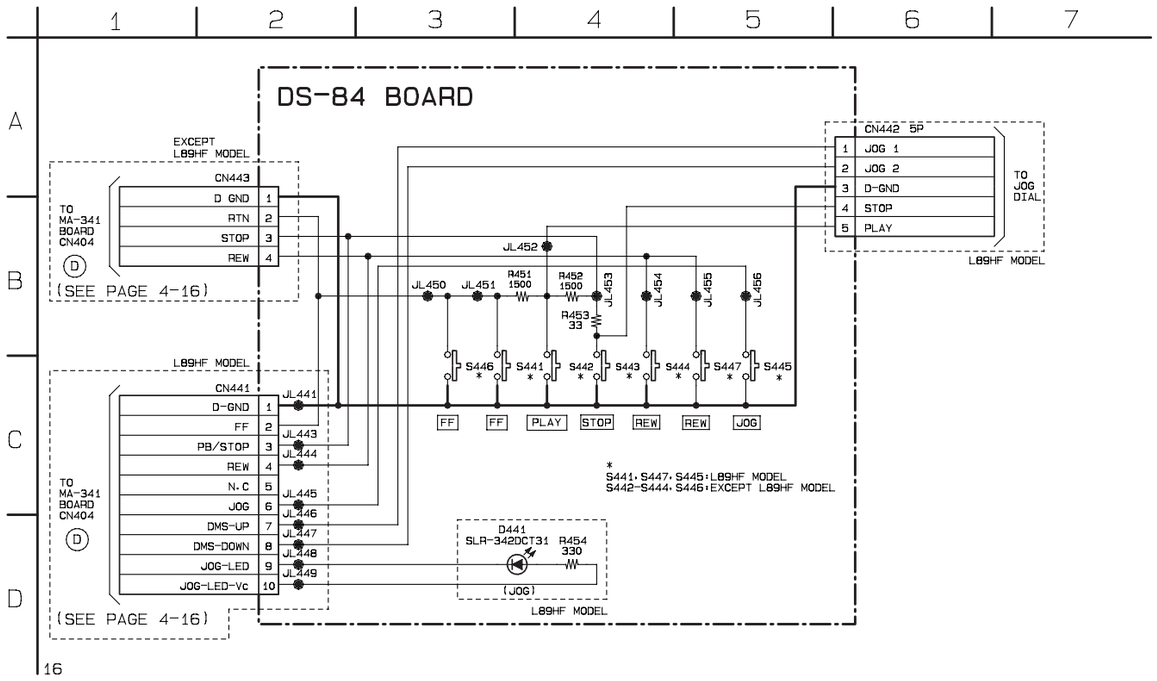
There are few cases that the part printed on this diagram isn't mounted in this model.





DS-84 (TAPE OPERATION) SCHEMATIC DIAGRAMS

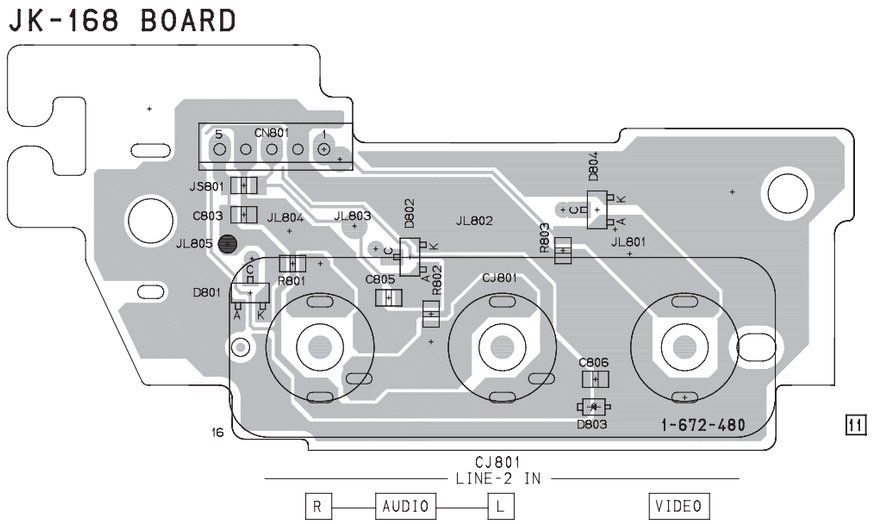
— Ref. No. DS-84 Board; 3,000 Series —

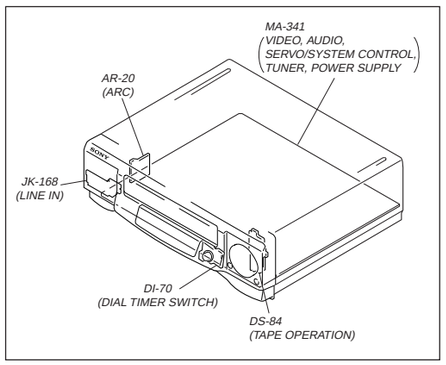


JK-168 (LINE IN) PRINTED WIRING BOARD

— Ref. No. JK-168 Board; 4,000 Series —

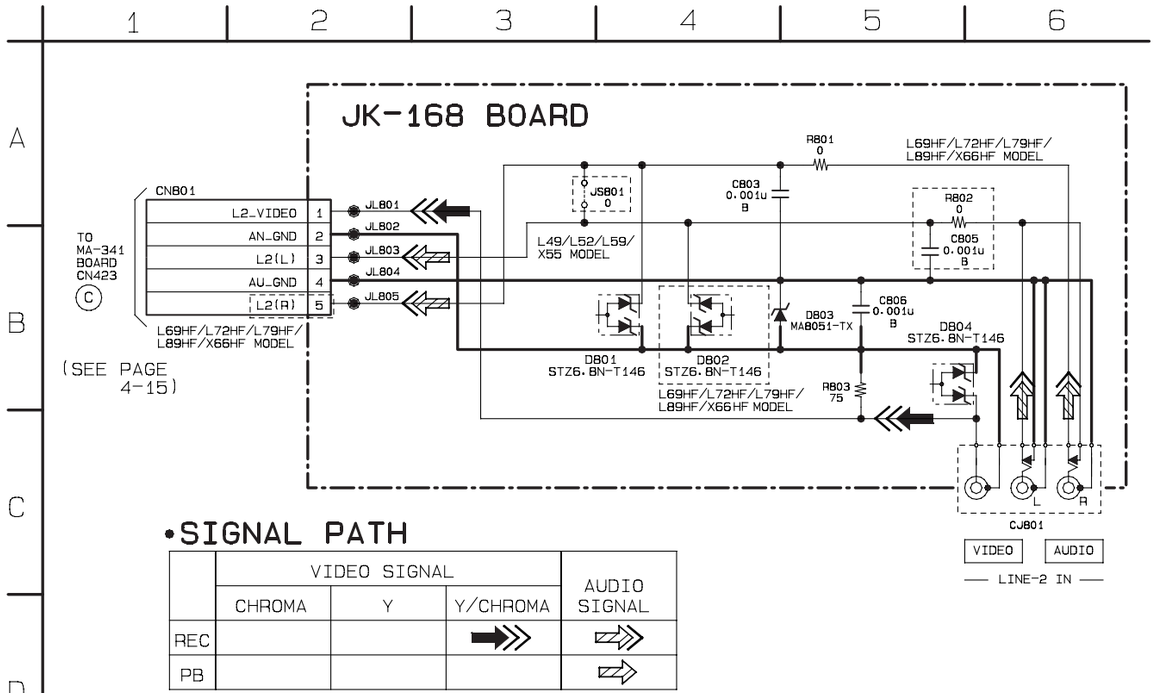
There are few cases that the part printed on this diagram isn't mounted in this model.





JK-168 (LINE IN) SCHEMATIC DIAGRAMS

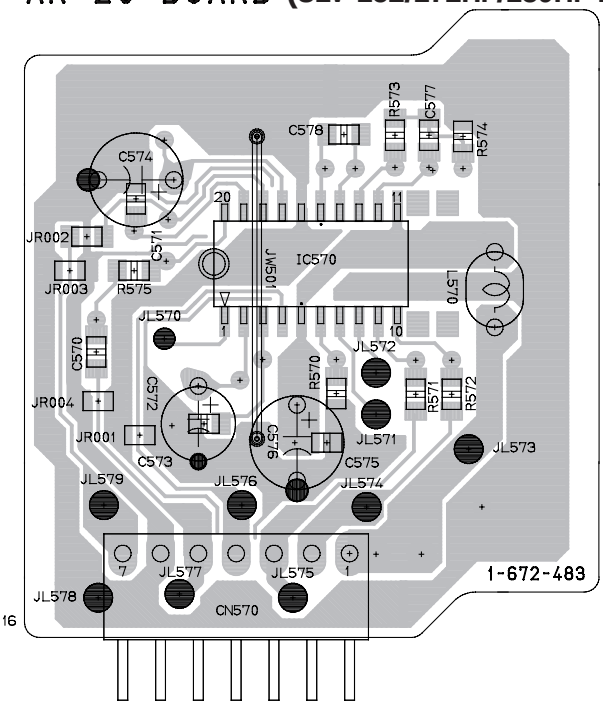
— Ref. No. JK-168 Board; 4,000 Series —

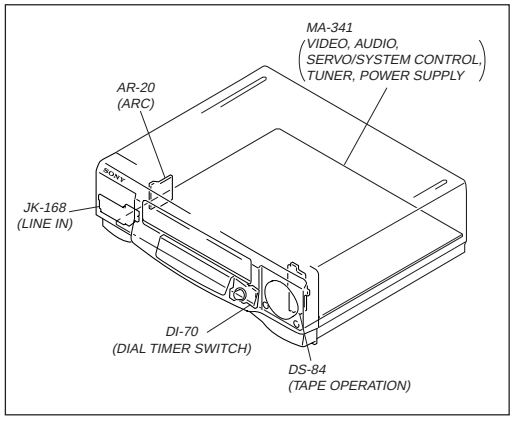


AR-20 (ARC) PRINTED WIRING BOARD
— Ref. No. AR-20 Board; 5,000 Series —

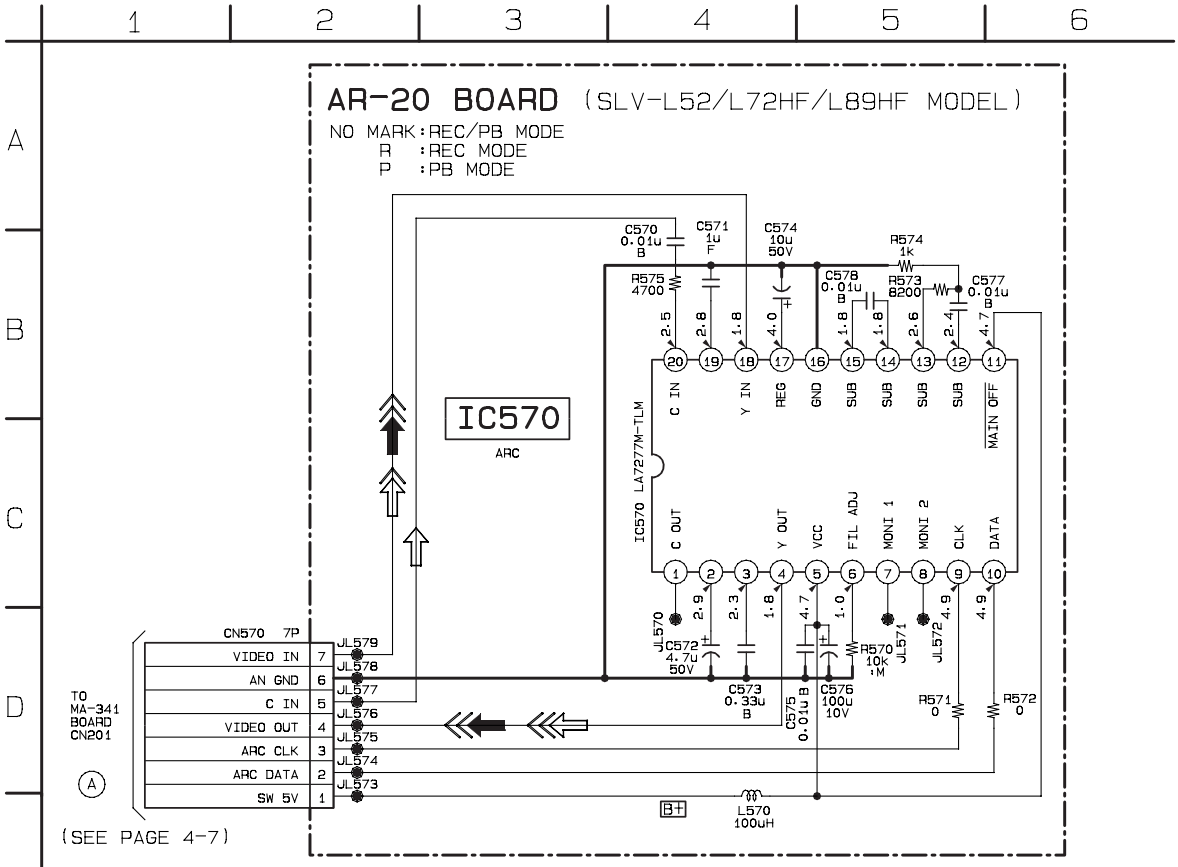
There are few cases that the part printed on this diagram isn't mounted in this model.

AR-20 BOARD (SLV-L52/L72HF/L89HF MODEL)





AR-20 (ARC) SCHEMATIC DIAGRAMS
— Ref. No. AR-20 Board; 5,000 Series —



•SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			⇛
PB	⇨	⇨	⇛

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SECTION 5
INTERFACE, IC PIN FUNCTION DESCRIPTION

5-1. SYSTEM CONTROL — MECHANISM BLOCK INTERFACE (MA-341 BOARD IC160)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOARDING	CASSETTE UNLOARDING	TAPE THREADING	TAPE UNTEREADING	STOP	FF	REW	PB	REC
CAM	MA-341 Board IC160㉝	O	*5	H	L	H	L	*5	*5	*5	*5	*5
MODE 1	MA-341 Board IC160㉙	I	—	—	—	—	—	H	H	H	H	H
MODE 2	MA-341 Board IC160㉘	I	—	—	—	—	—	L	L	L	H	H
MODE 3	MA-341 Board IC160㉗	I	—	—	—	—	—	H	H	H	L	L
MODE 4	MA-341 Board IC160㉖	I	—	—	—	—	—	H	L	L	L	L
REC PRF	MA-341 Board IC160㉚	I	L	*1	*1	*1	*1	*1	*1	*1	*1	*1
T REEL	MA-341 Board IC160㉚	I	H/L	H/L	H/L	H/L	H/L	H/L	*2	*2	*2	*2
S REEL	MA-341 Board IC160㉙	I	H/L	H/L	H/L	*2	*2	H/L	*2	*2	*2	*2
END LED	MA-341 Board IC160⑳	O	L	*3	*3	*3	*3	*3	*3	*3	*3	*3
T SENS	MA-341 Board IC160⑦	I	*3	*3	*3	*4	*4	*4	*4	*4	*4	*4
S SENS	MA-341 Board IC160⑥	I	*3	*3	*3	*4	*4	*4	*4	*4	*4	*4

*1 "L" When erasing protection tab is bent. "H" when not bent.
*2 Pulse of period in proportion to reel rotating speed.
*3 Approx. 2 msec period "H" pluse when tape top or end is detected.
*4 Normally "L". 2 msec period "H" puise when tape top or end is detected.
*5 Hi-Z

5-2. SYSTEM CONTROL — SERVO PERIPHERAL CIRCUIT INTERFACE (MA-341 BOARD IC160)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTEREADING	PB	REC
CTL IN+	MA-341 Board IC160㉟	O	*7	*7	*7	*7	*7	*7	*1
DRUM PG	MA-341 Board IC160㉚	I	*3	*3	*3	*3	*3	*3	*3
DRUM FG	MA-341 Board IC160㉙	I	*4	*4	*4	*4	*4	*4	*4
CAP FG	MA-341 Board IC160㉗	I	H/L	*2	*2	*5	*5	*2	*2
CAP RVS	MA-341 Board IC160㉔	O	H/L	L	H	L	H	L	L
CAP ERR	MA-341 Board IC160㉖	O	L	*6	*6	*6	*6	*6	*6
DRUM ERR	MA-341 Board IC160㉗	O	*6	*6	*6	*6	*6	*6	*6

*1. 30Hz pulse.
*2. Pulse of period in propotion to tape speed.
*3. 30Hz "H" pluse.
*4. 720 Hz pulse.
*5. Unstable period pulse.
*6. DC voltage 1 – 5V.
*7. Hi-Z (2.5V)

5-3. SYSTEM CONTROL — SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-341 BOARD IC160)

Signal	Pin No.	I/O	I/O level
RESET	MA-341 Board IC160㉞	I	Normally “H”, “L” when service interruption detected or restored.
I2C DATA 1	MA-341 Board IC160㉜	I/O	Serial communication data to EEPROM I2C161.
I2C CLOCK 1	MA-341 Board IC160㉛	O	Serial communication clock to EEPROM I2C161.
I2C DATA VIDEO	MA-341 Board IC160⑦②	I/O	Serial communication data to video and audio microprocessor.
I2C CLOCK VIDEO	MA-341 Board IC160⑦①	O	Serial communication clock to video and audio microprocessor.
*(ARC) S OUT 1	MA-341 Board IC160㊷	I/O	Serial communication data to ARC microprocessor.
*(ARC) CLK 1	MA-341 Board IC160㊶	O	Serial communication clock to ARC microprocessor.

* ; L52: PA/PC, L72HF: PA/PC, L89HF: MX/CS/VZ model only

5-4. SYSTEM CONTROL AND RF MODULATOR — INPUT SELECTION BLOCK INTERFACE (MA-341 BOARD IC160)

Signal	Pin No.	I/O	I/O level
ANT SEL	MA-341 Board IC160㉑	O	“L” when RF modulator through.

5-5. SYSTEM CONTROL — VIDEO/RP BLOCK INTERFACE (MA-341 BOARD IC160)

Signal	Pin No.	I/O	STOP/FF /REW	TAPE LOADING	TAPE UNLOADING	PB	REC	REC PAUSE
RF SWP	MA-341 Board IC160⑱	O	*1	*1	*1	*1	*1	*1
QVD	MA-341 Board IC160⑬	O	L	L	L	*2	L	L
C SYNC	MA-341 Board IC160㊽	I	*3	*3	*3	*3	*3	*3

*1. Synchronized with drum rocation, 30Hz 50% duty pulse.
*2. Normal “L”, “H” when video signal is not rgenerated.
*3. Composite sync signal (positive).

5-6. SYSTEM CONTROL — AUDIO BLOCK INTERFACE (MA-341 BOARD IC160)

Signal	Pin No.	I/O	STOP/FF /REW	TAPE LOADING	TAPE UNLOADING	PB	REC	REC PAUSE
A MUTE	MA-341 Board IC160㊸	O	L	L	L	L	L	H
AF REC P	MA-341 Board IC160㉒	O	L	L	L	L	L	H

- Abbreviation
  MX : Mexican
  PA : Panama
  PC : Colombia
  CS : Chilian, Bolivia, Peru
  VZ : Venezuelan

5-7. SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTIONS (MA-341 BOARD IC160)

Pin No.	Pin Name	I/O	Function
1	DEST	I	Destination control input
2	FULL ERS		NC
3	TU AFT	I	Tuner analog AFT input
4	FUNC KEY2	I	Key input
5	FUNC KEY1	I	Key input
6	S SENS	I	Tape end sensor input
7	T SENS	I	Tape top sensor input
8	V RF ENV	I	Video playback signal envelope input
9	AF ANV	I	Hi-Fi audio playback signal envelope input
10	CBC ON	O	Cable box control signal output
11	KKP+	I	ETR pulese signal input
12	KKP–	I	ETR pulese signal input
13	QVD	O	Quasi VD pulese output
14	REMOCON	I	Remote sires signal input
15	C ROT	O	Head AZ signal output
16	HA SWP	O	SP/EP changed head signal
17	ENV SW	I	SP/EP head output lebel ditaction signal
18	RF SWP	O	VIDEO RF switching pulse output.
19	AF SWP	O	AF switching pulse output.
20	END LED	O	END sensor LED output
21	ANT SEL	O	TV/VTR RF modulator control output
22	AF REC P	O	Hi-Fi record control pulse output.
23	FE ON		NC
24	CAP RVS	O	Capstan reverse control
25	SUR ON		NC
26	MODE4	I	Mechanism section CAM encoder input (data4)
27	MODE3	I	Mechanism section CAM encoder input (data3)
28	MODE2	I	Mechanism section CAM encoder input (data2)
29	MODE1	I	Mechanism section CAM encoder input (data1)
30	REC PRF	I	Erasing protection tab, cassette IN detection input
31	I2C CLK EEP	I/O	HC CLOCK line (EEPROM)
32	I2C DATA EEP	I/O	HC DATA line (EEPROM)
33	CAM	O	Cam motor control signal output
34	RESET	I	System reset input
35	32kHz (in)	I	Sub clock 32MHz
36	32kHz (out)	O	Sub clock 32MHz
37	Vcc	I	5V
38	4fsc (in)	I	Main clock input
39	4fsc (out)	O	Main clock output
40	Vss		Ground
41	ARC CLK	O	Rearityregenarator (ARC) control clock signal
42	ARC DATA	O	Rearityregenarator (ARC) control data signal
43	CLK SEL	I	CLOCK seleal “L” Sub clock, “H” main and sub clock.
44	OSC IN	I	OSD clock input
45	OSC OUT	O	OSD clock output
46	NUB		Ground
47	LPF	I/O	fsc filter
48	$\overline{SP}$	O	“L” output when SP mode.
49	OSD GND		Ground
50	OSD V IN	I	OSD Video signal input.

Pin No.	Pin Name	I/O	Function
51	WHITE LEVEL	I	White level signal input
52	OSD V OUT	O	OSD Video signal output
53	OSD Vcc		SW 5V (OSD block)
54	HLF	I/O	External low-pass filter for slicer/AFC is connected to this terminal
55	V HOLD	I/O	External capacitor for slicer is connected to this terminal
56	C VIDEO IN	I	Control video signal input (osd, tuner, sorvo)
57	NUA		D Ground
58	C SYNC	I	Composite sync input
59	PLL CLK	O	Tuner PLL clock output
60	PLL DATA	O	Tuner PLL data output
61	PLL ENABLE	O	Tuner enable output
62	TA MUTE	O	Tuner audio mute output
63	A MUTE	O	AUDIO mute output
64	P CONT M12	O	Motor 12V control output
65	P CONT SW12	O	SW 12V control output
66	$\overline{\text{FLD CS}}$	O	FLD drive chip select signal output
67	$\overline{\text{V-SET CS}}$	O	V-set micon chip select signal output
68	S OUT0	O	Serial communication signal (FLD, V-SET)
69	S IN 0	I	Serial communication signal (FLD, V-SET)
70	S CLK 0	O	Serial communication signal (FLD, V-SET)
71	I2C CLK	I/O	IIC clock signal (VIDEO, HiFi)
72	I2C DATA	I/O	IIC data signal (VIDEO, HiFi)
73	CBC SIRCS OUT	O	Cable mouse sircs signal output
74	BUZZER		NC
75	NICOLE	O	Timing signal output
76	CAP ERR	O	Capstan error D/A output
77	DRUM ERR	O	Drum error D/A output
78	P FAIL	I	Power fail detection input
79	S REEL	I	Supply reel sensor input
80	T REEL	I	Take up reel sensor input
81	DMS+	I	DMS control input
82	DMS–	I	DMS control input
83	$\overline{\text{MAIN}}$/SAP	O	Tuner MAIN/SAP select signal
84	F MONO	O	Tuner audio normal select
85	$\overline{\text{STEREO}}$	I	Tuner Stereo ditection “L” when Stereo mode.
86	$\overline{\text{SAP}}$	I	Tuner SAP ditection “L” when SAP mode.
87	CAP FG	I	Capstan FG signal input
88	AMP Vss		Ground
89	DRUM FG	I	Drum FG input.
90	DRUM PG	I	Drum PG input.
91	AMP Vref OUT	O	Analog AMP reference Vcc output
92	AMP Vref IN	I	Analog AMP reference Vcc input
93	RC CHECK	I	Check input
94	CTL–IN	I/O	Control signal IN/OUT
95	CTL+IN	I/O	Control signal IN/OUT
96	AMP C		Control signal AC conect
97	CTL AMP OUT	O	Control signal AMP output
98	AMP Vcc		D-5V
99	A Vcc		D-5V
100	$\overline{\text{V-SET RESET}}$	O	NC

SECTION 6
ADJUSTMENTS

6-1 MECHANICAL ADJUSTMENTS

For the mechanical adjustments, please refer to the "VHS MECHANICAL ADJUSTMENT MANUAL Ⅵ (S MECHANISM)" (9-921-647-11).

6-2. ELECTRICAL ADJUSTMENTS

See the adjusting part location diagram from on page 6-6 for the adjustment.

1. PREPARATION BEFORE ADJUSTMENT

1-1. Equipment Required

The measuring instruments used for this alignment include:

1) Monitor TV
2) Oscilloscope, dual-trace, bandwidth of 30 MHz or more, with delay mode (A probe 10:1 should be used unless otherwise specified.)
3) Frequency counter
4) NTSC Pattern generator
5) Remote commander
6) Digital voltmeter
7) Audio generator
8) Audio level meter
9) Audio attenuator
10) Alignment tapes
    KRV-51N2 (NTSC) Part No. : 8-192-605-32

1-2. Equipment Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

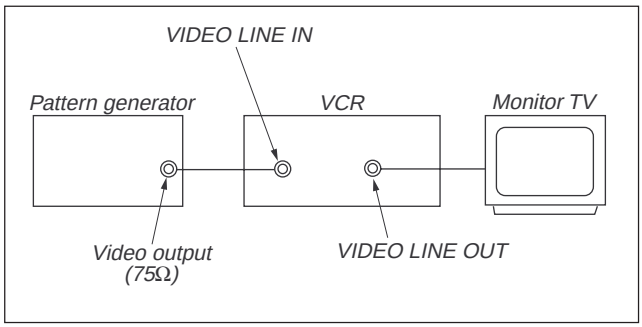


Fig. 6-2-1

1-3. Set-up of Adjustment

In this adjustment, NTSC pattern generator is connected with LINE input terminal. When check to tuner, connected AERIAL terminal. Check that the synchronizing signal of the Y signal has an amplitude of approximately 0.7 V and that the burst signal has an amplitude of approximately 0.3 V and its waveform is flat. And check that the level ratio of burst signal to "red" signal is 0.30 : 0.66. The video signal (color bar) used for electrical aligning this unit is shown in Fig. 6-2-2.

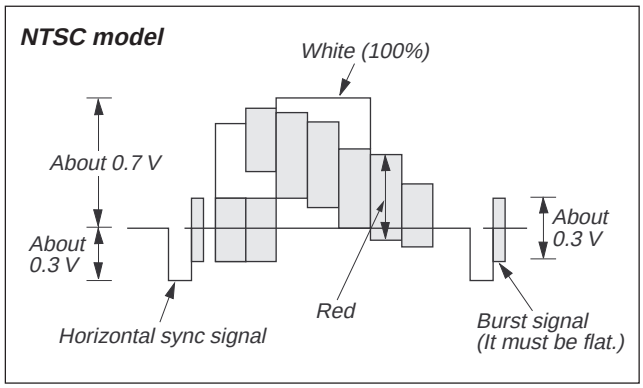


Fig. 6-2-2 Color Bar Signals of Pattern Generator

1-4. Alignment Tape

• Contents of KRV-51N2

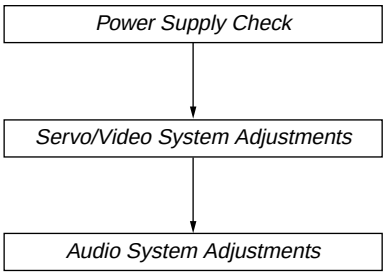
	Mode	Period	Video signal	Audio signal	
				Hi-Fi	Normal
1	SP	7 minutes	Color bar	400Hz (L/R)	400Hz
2		3 minutes	Monoscope		
3	LP	7 minutes	Color bar		
4		3 minutes	Monoscope		

1-5. Input/Output Levels and Impedance

Video input: LINE IN
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
Video output: LINE OUT
Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
Audio input: LINE IN
Input level: –7.5 dBs
(0 dBs= 0.775 Vrms)
Input impedance: more than 47 kilohms
Audio output: LINE OUT
Standard level: –7.5 dBs at load impedance 47 kilohms
Output impedance: less than 10 kilohms

1-6. Adjustment Sequence

The adjustments should be performed in the following sequence.



2. POWER SUPPLY CHECK

2-1. Output Voltage Check (MA-341 Board)

Mode	STANDBY
+30 V Check	
Measurement point	C627 ⊕
Specified value	31.0 – 39.0 V
–11 V Check	
Measurement point	C642 ⊖
Specified value	–12.5 – – 9.5 V

+6 V Check	
Measurement point	Corrector of Q607
Specified value	5.56 – 6.25 V
Mode	E-E
Measuring Instrument	Digital voltmeter
+12 V Check	
Measurement point	IC601 pin ②
Specified value	11.7 –12.3 V
+5 V Check	
Measurement point	Emitter of Q603
Specified value	4.8 –5.4 V
MTR12 V Check	
Measurement point	Correcter of Q605
Specified value	12.5 –14.5 V

[Check Method]

1) Each of these supply voltages must meet its specified value.

3. SERVO SYSTEM CHECK

3-1. RF Switching Position Adjustment (MA-341 Board)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape: SP color bar portion
Measurement point	CH1: CN270 pin ② (PB RF) CH2: CN270 pin ③ (RF SWP)
Measuring instrument	Oscilloscope
Adjusting element	REMOCON CH+/–
Specified value	A=minimize

[Adjustment Method]

1) Playback the alignment tape.
2) Short JS401 to Ground.
3) Check that "A P" is indicated on FL display.
4) Adjust so that part A becomes minimized at CH +/–.
5) Write data in EEPROM by pressing PAUSE button.

Monoral model:

6) The display "A P" disappears and then the Adjustment mode terminates.

Hi-Fi model:

6) The display changes to "A H" and the mode goes to the HiFi switching position Adjustment.

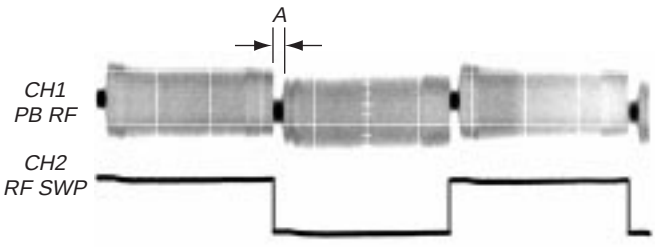


Fig. 6-2-3

4. AUDIO SYSTEM ADJUSTMENT

- Adjust both L ch and R ch.

[Connecting Instruments]

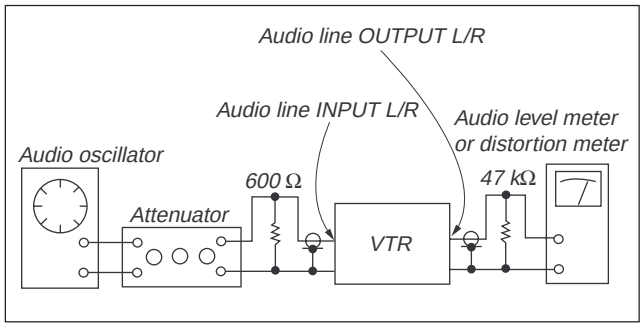


Fig. 6-2-4

4-1. Hi-Fi Audio System Adjustment (Hi-Fi model only)

- Perform the adjustment setting the switch on the following positions.
- AUDIO MONITOR ..... STEREO

[Adjustment Method]

1. ACE head adjustment.....Refer to the VHS mechanical adjustment manual Ⅵ (S MECHANISM)(9-921-647-11).
2. E-E output level check
3. "Recording Bias Adjustment"

-

4-2. HiFi Switching Position Adjustment (MA-341 Board)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape: SP color bar portion
Measurement point	CH1: Pin ① of CN270 (HF ADJ) CH2: Pin ③ of CN270 (RF SWP)
Measuring instrument	Oscilloscope
Adjusting element	REMOCON CH +/–
Specified value	B=minimize

[Adjustment Method]

1) Check that "A H" is indicated on FL display.
2) Adjust so that part B becomes minimized at CH +/–.
3) Write data EEPROM by pressing PAUSE button.
4) Check that "A H" indicator turns off.
5) If "A H" indicator is still on, restart RF switching position Adjustment from the beginning.

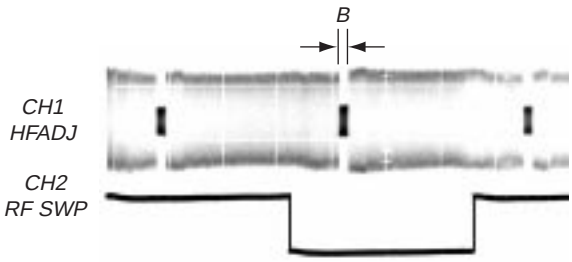


Fig. 6-2-5

4-3. Normal Audio System Adjustment

- Make adjustment in the SP mode unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

4-3-1. ACE Head Adjustment

Refer to the VHS mechanical adjustment manual Ⅵ (S MECHANISM) (9-921-647-11).

4-3-2. E-E Output Level Check

[Adjustment purpose]

Confirm that the output level adjust the reference input is within the specification.

Mode	E-E
Signal	400 Hz, –7.5 dBs
Measurement point	CJ561 L/R
Measuring instrument	Audio level meter
Specified value	–7.5 ± 2 dBs

[Check Method]

1) Input signal of 400 Hz and –7.5 dBs to the CJ561 L/R.
2) Check that the audio output level is –7.5 ± 2 dBs.

4-3-3. Frequency Response Check

[Adjustment purpose]

Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP mode)
Signal	400 Hz, –17.5 dBs 7 kHz, –17.5 dBs
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	0 ± 3 dB

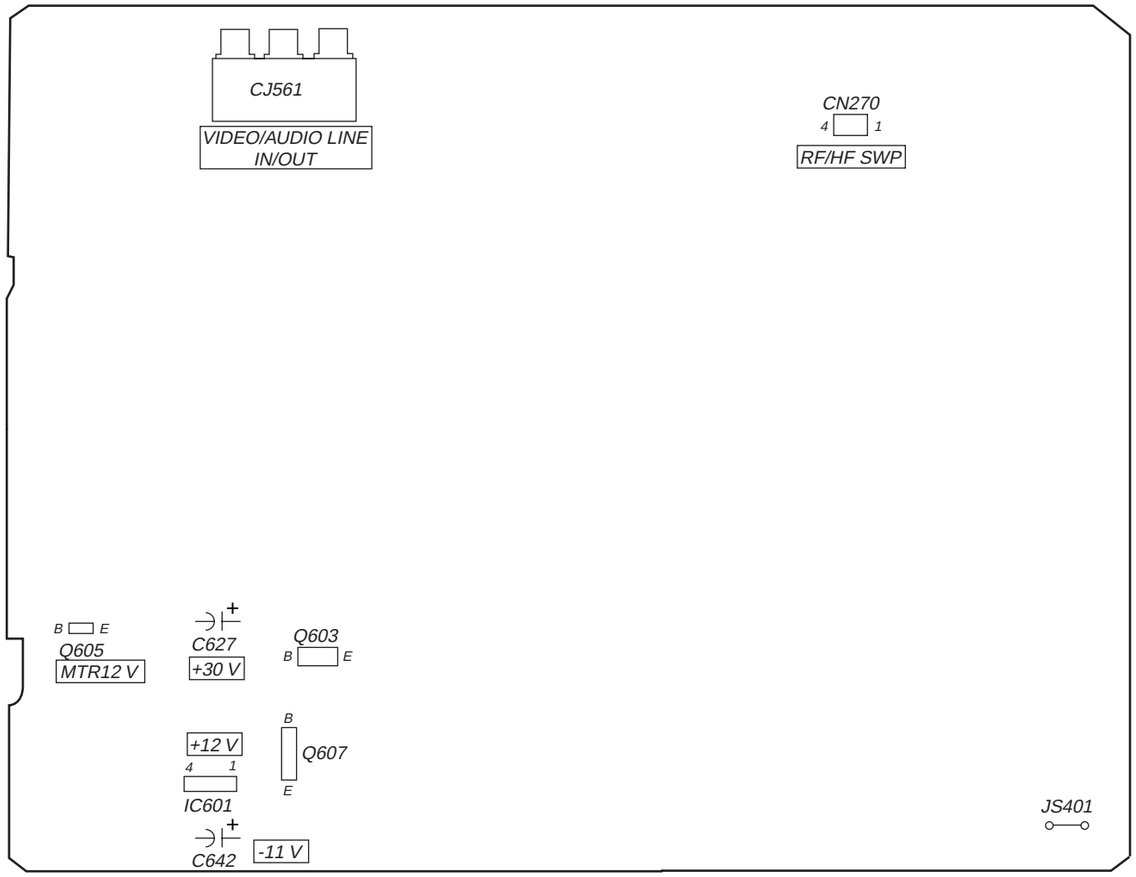
Note: Tape path adjustment must have been completed.

[Confirmation Method]

1) Supply a signal of 400 Hz, –17.5 dBs to both L and R channels of Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate –17.5 dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7 kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
7) Confirm that the 7 kHz playback output level within a range of the 400 Hz playback output level 0 ± 3 dB.

5. ADJUSTING PARTS LOCATION DIAGRAM

MA-341 BOARD
(CONDUCTOR SIDE)



SECTION 7
REPAIR PARTS LIST

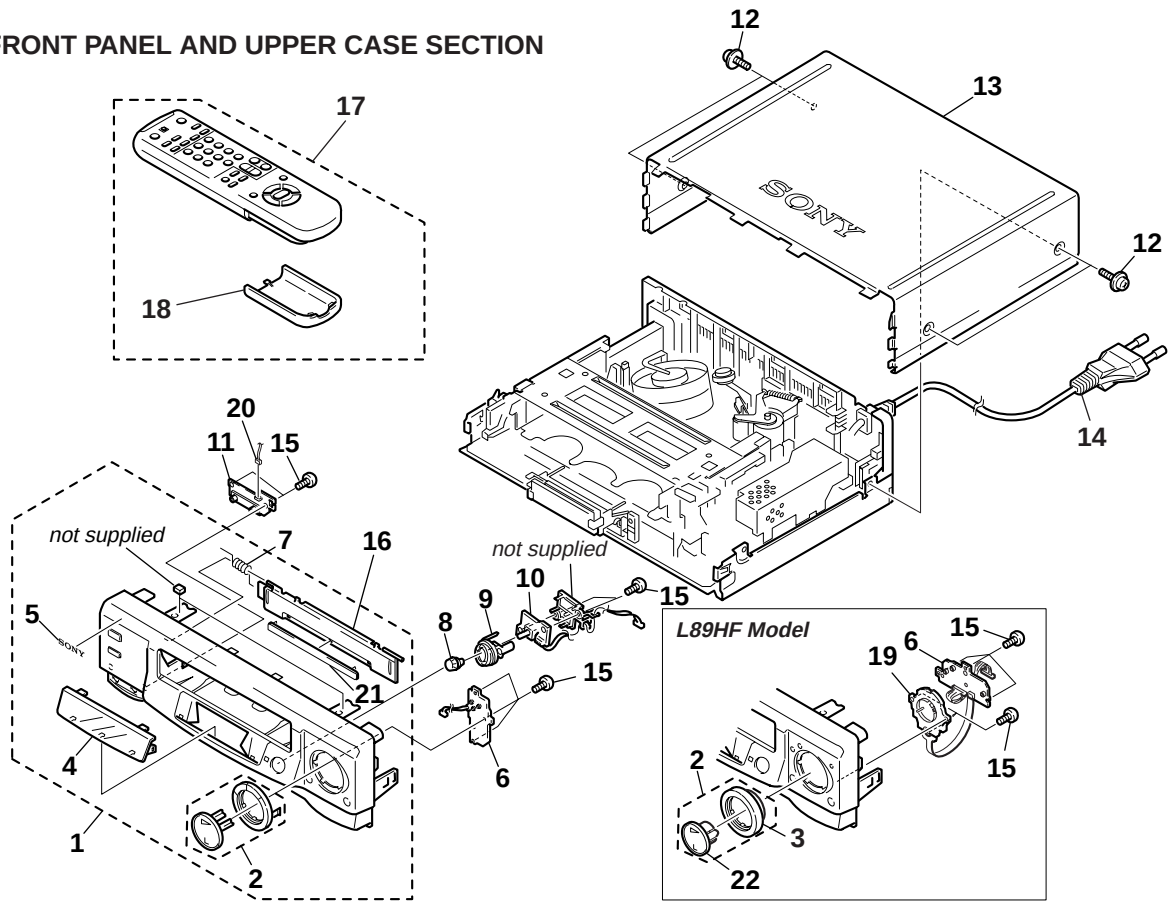
7-1. EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Abbreviation
  MX : Mexican
  CS : Chilian, Bolivia, Peru
  PR : Puerto Rico
  VZ : Venezuelan

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

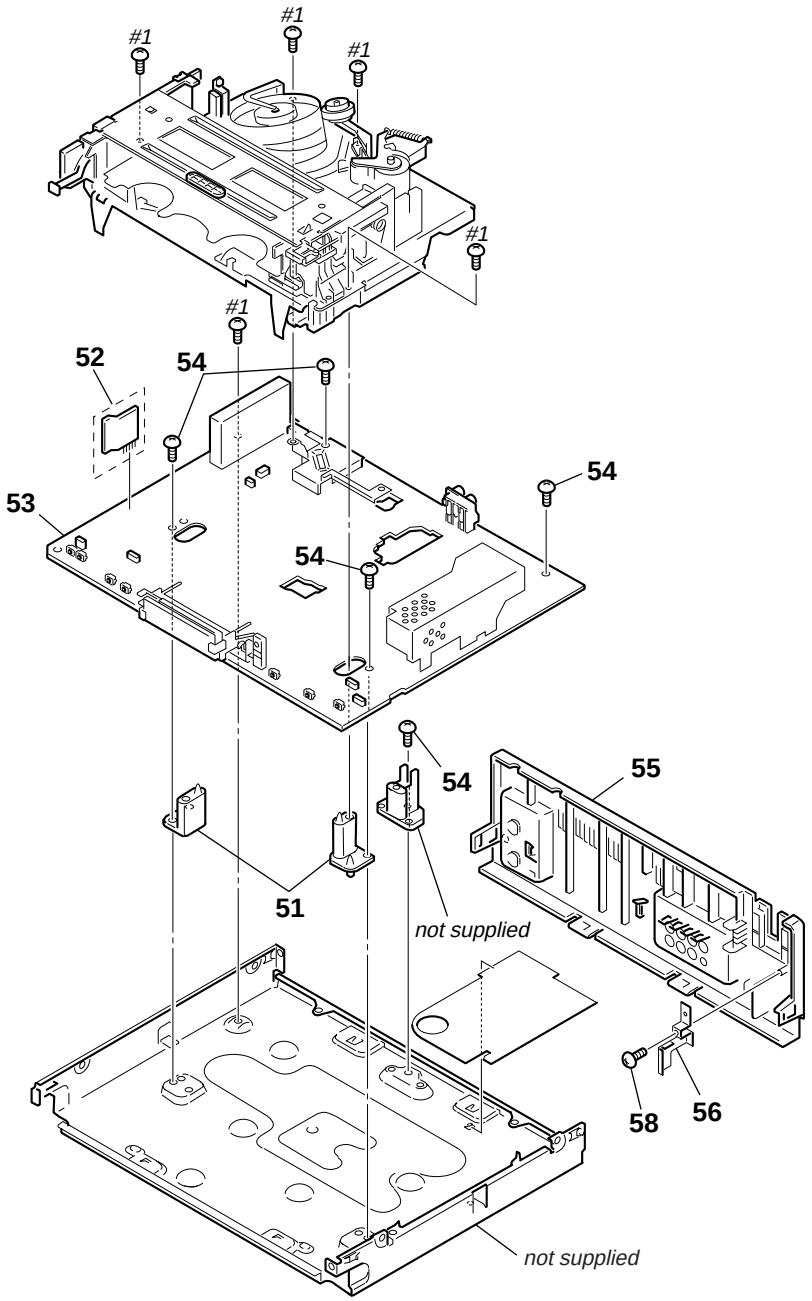
7-1-1. FRONT PANEL AND UPPER CASE SECTION



Ref. No.	Part No.	Description	Remarks
1	X-3949-155-1	PANEL ASSY, FRONT (X55)	
1	X-3949-156-1	PANEL ASSY, FRONT (L89HF)	
1	X-3949-158-1	PANEL ASSY, FRONT (L49)	
1	X-3949-159-1	PANEL ASSY, FRONT (L52)	
1	X-3949-160-1	PANEL ASSY, FRONT (X66HF)	
1	X-3949-161-1	PANEL ASSY, FRONT (L69HF)	
1	X-3949-162-1	PANEL ASSY, FRONT (L72HF)	
1	X-3949-266-1	PANEL ASSY, FRONT (L79HF)	
1	X-3949-267-1	PANEL ASSY, FRONT (L59)	
2	X-3949-164-1	BUTTON ASSY, FUNCTION (L52/L59/L72HF/L79HF/X55/X66HF)	
2	X-3949-165-1	BUTTON ASSY, FUNCTION (L49/L69HF)	
3	3-053-232-11	RING, JOG (L89HF)	
4	3-053-243-01	PLATE, FROSTED (L49/L59/L69HF/L79HF/X55/X66HF)	
4	3-053-243-11	PLATE, FROSTED (L52/L72HF/L89HF)	
5	3-943-995-01	EMBLEM (NO.5), SONY	
* 6	A-6794-649-A	DS-84 BOARD, COMPLETE (EXCEPT L89HF)	
* 6	A-6794-653-A	DS-84 BOARD, COMPLETE (L89HF)	
7	3-953-432-01	SPRING (GE), FL	
8	3-053-228-01	KNOB, ETR	
9	3-053-229-01	ESCUTCHEON, ETR	
* 10	A-6794-650-A	DI-70 BOARD, COMPLETE	
* 11	A-6794-651-A	JK-168 BOARD, COMPLETE (L49/L52/L59/X55)	
* 11	A-6794-652-A	JK-168 BOARD, COMPLETE (L69HF/L72HF/L79HF/X66HF)	
* 11	A-6794-654-A	JK-168 BOARD, COMPLETE (L89HF)	

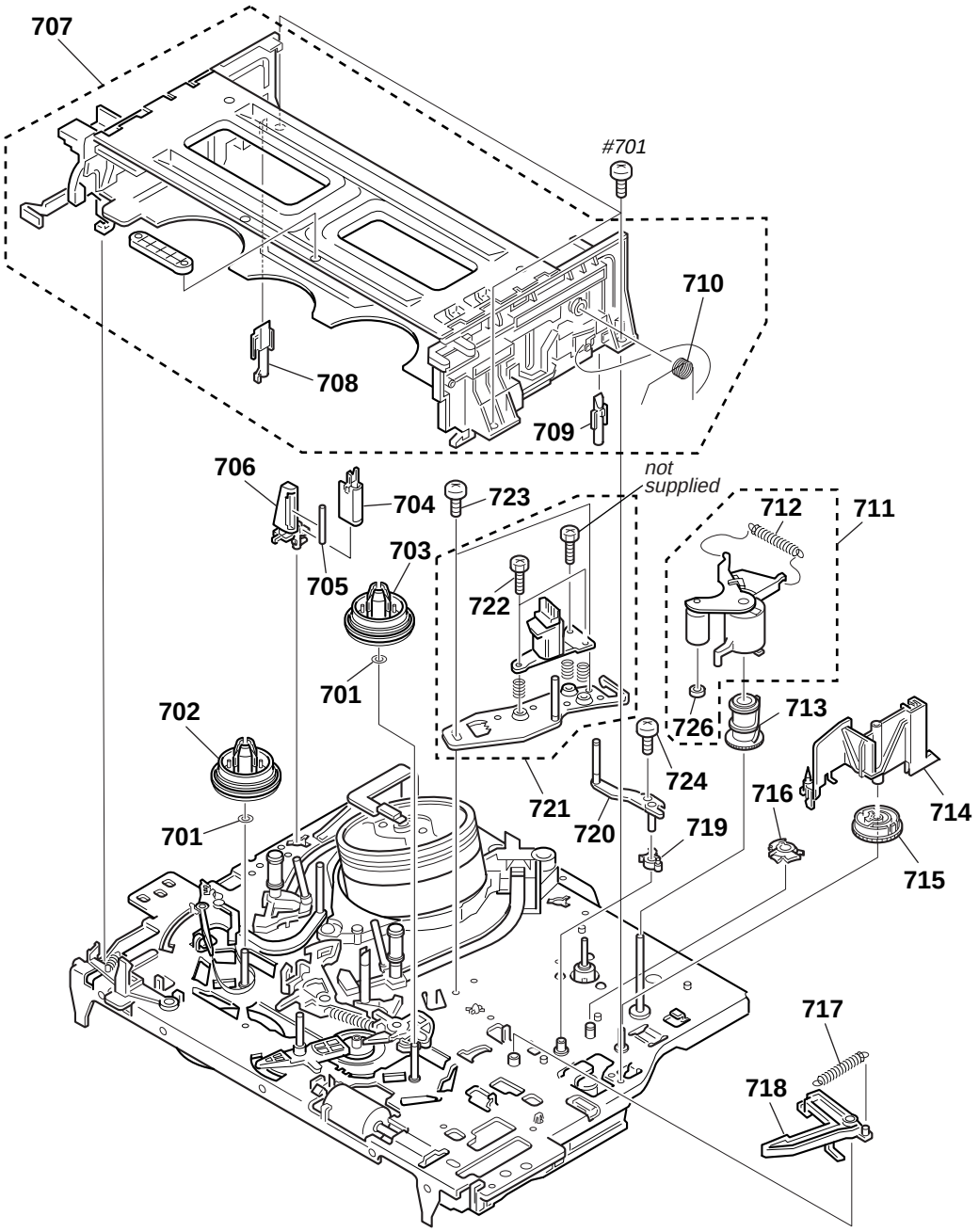
Ref. No.	Part No.	Description	Remarks
12	3-710-901-01	SCREW, TAPPING	
13	3-053-307-21	CASE, UPPER (L52/L59/L72HF/L79HF/L89HF/X55/X66HF)	
13	3-053-307-31	CASE, UPPER (L49/L69HF)	
⚠14	1-777-852-12	CORD, POWER (L49/L52/L59:VZ,L69HF/L72HF/L79HF:VZ/L89HF:MX,VZ/X55/X66HF)	
⚠14	1-782-000-13	CORD, POWER (L59:CS,PR/L79HF:CS,PR/L89HF:CS)	
⚠14	1-782-001-13	CORD, POWER (L59:CS,PR/L79HF:CS,PR/L89HF:CS)	
15	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
16	3-053-286-01	DOOR, CASSETTE (L52/L59/L72HF/L79HF/L89HF/X55/X66HF)	
16	3-053-286-11	DOOR, CASSETTE (L49/L69HF)	
17	1-418-154-11	COMMANDER, STANDARD (RMT-V267) (L69HF/L72HF/L79HF/L89HF/X66HF)	
17	1-418-155-11	COMMANDER, STANDARD (RMT-V268) (L49/L52/L59/X55)	
18	3-709-128-01	COVER, BATTERY (L69HF/L72HF/L79HF/L89HF/X66HF)	
18	3-709-129-01	COVER, BATTERY (L49/L52/L59/X55)	
19	1-762-844-21	SWITCH, ROTARY (L89HF)	
20	1-779-725-11	CONNECTOR, BOARD TO BOARD 5P	
21	3-053-240-01	PLATE, DOOR ORNAMENTAL (L49/L52/L59/X55)	
21	3-053-240-11	PLATE, DOOR ORNAMENTAL (L69HF/L72HF/L79HF/L89HF/X66HF)	
22	3-053-231-11	BUTTON, CENTER (L89HF)	

7-1-2. CHASSIS SECTION



Ref. No.	Part No.	Description	Remarks
51	3-959-383-01	BASE (R), MD	
* 52	A-6794-655-A	AR-20 BOARD, COMPLETE (L52/L72HF/L89HF)	
* 53	A-6791-736-A	MA-341 BOARD, COMPLETE (L49/L59:VZ,X55)	
* 53	A-6791-737-A	MA-341 BOARD, COMPLETE (L69HF/L79HF:VZ/X66HF)	
* 53	A-6791-738-A	MA-341 BOARD, COMPLETE (L79HF:CS,PR)	
* 53	A-6791-739-A	MA-341 BOARD, COMPLETE (L59:CS,PR)	
* 53	A-6791-740-A	MA-341 BOARD, COMPLETE (L89HF:MX,VZ)	
* 53	A-6791-741-A	MA-341 BOARD, COMPLETE (L89HF:CS)	
* 53	A-6791-742-A	MA-341 BOARD, COMPLETE (L72HF)	
* 53	A-6791-743-A	MA-341 BOARD, COMPLETE (L52)	
54	3-970-608-21	SUMITITE (B3), +BV	
* 55	3-987-076-01	PANEL, REAR(L69HF/L72HF/L79HF/L89HF/ X66HF)	
* 55	3-987-076-11	PANEL, REAR(L49/L52/L59/X55)	
56	3-988-087-11	BRACKET (BP) (L59:CS,PR/ L79HF:CS,PR/ L89HF:CS)	
58	3-970-608-21	SUMITITE (B3), +BV	

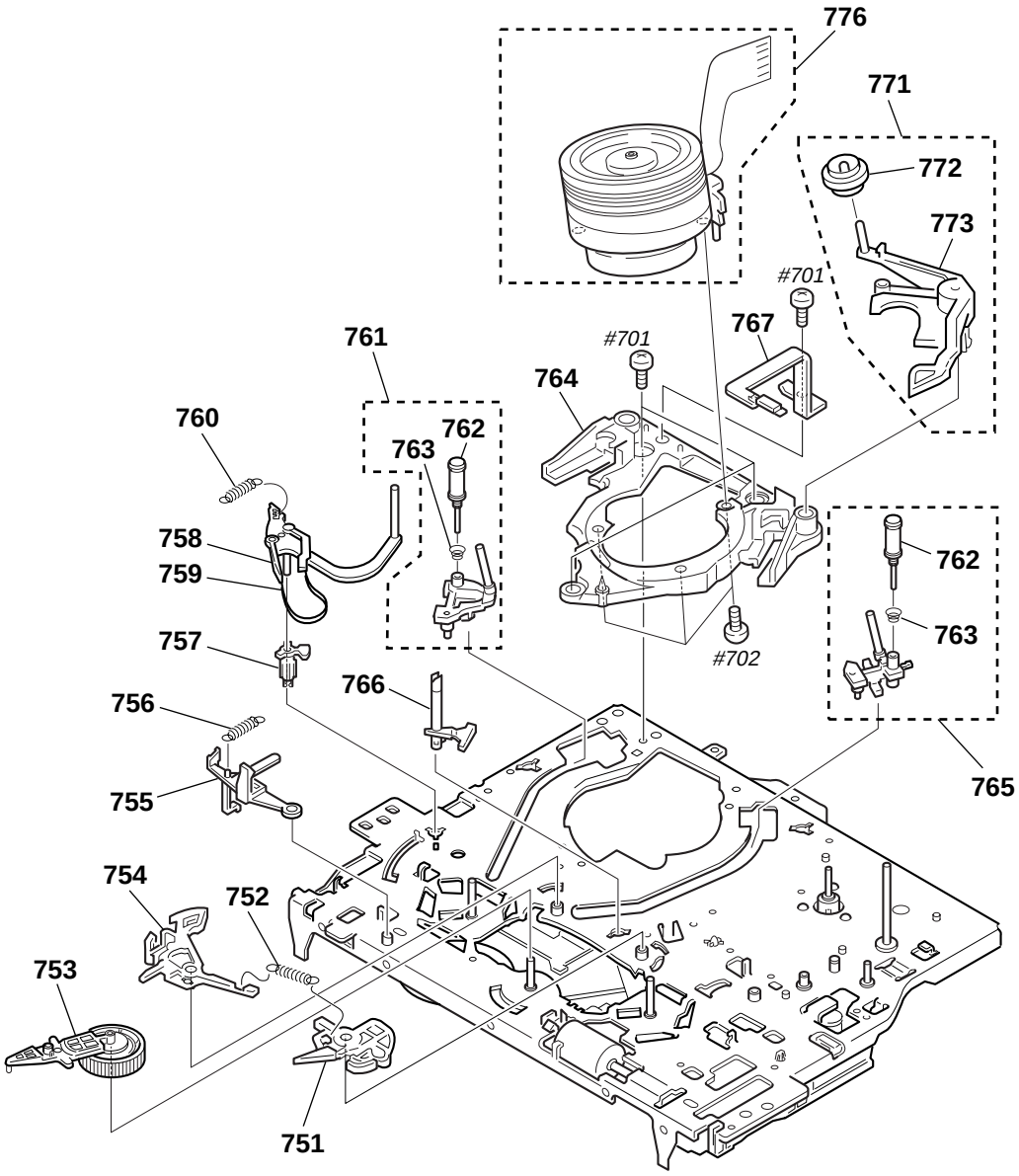
7-1-3. MECHANISM DECK SECTION-1



Ref. No.	Part No.	Description	Remarks
701	3-977-509-01	WASHER, THRUST	
702	3-977-507-01	TABLE, REEL (S) (GRAY)	
703	3-977-508-01	TABLE, REEL (T) (BLACK)	
704	1-500-144-11	HEAD, FE	
705	3-977-495-01	SHAFT TG2	
706	3-977-494-01	HOLDER, FEH	
707	A-6759-619-C	FL COMPLETE ASSY BOARD, COMPLETE	
708	3-977-535-01	PLATE, LUMINOUS (END SENSOR)	
709	3-977-536-01	PLATE, LUMINOUS (TOP SENSOR)	
710	3-970-471-01	SPRING (DECK OPEN), TORSION	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH	
712	3-958-455-01	SPRING (PINCH), TENSION	
713	3-977-447-01	GEAR, ELEVATOR	

Ref. No.	Part No.	Description	Remarks
714	3-977-514-01	OPENER, LID	
715	3-977-441-01	GEAR, PINCH PRESSING	
716	3-977-445-01	GEAR, TG8 ARM DRIVING	
717	3-977-465-01	SPRING, EXTENSION (RVS BRAKE)	
718	X-3947-582-1	ARM ASSY, RVS BRAKE	
719	3-977-446-01	GEAR, TG8 ARM	
720	X-3947-590-1	TG8 ASSY	
721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK)	
722	3-974-556-01	+HEXA TT 2.6 × 9 (TAPER)	
723	3-979-508-01	SCREW +HEXA TP SW 3 × 8	
724	3-719-381-01	SCREW (M2 × 4)	
726	3-736-045-01	BEARING (NO FLANG), BALL	

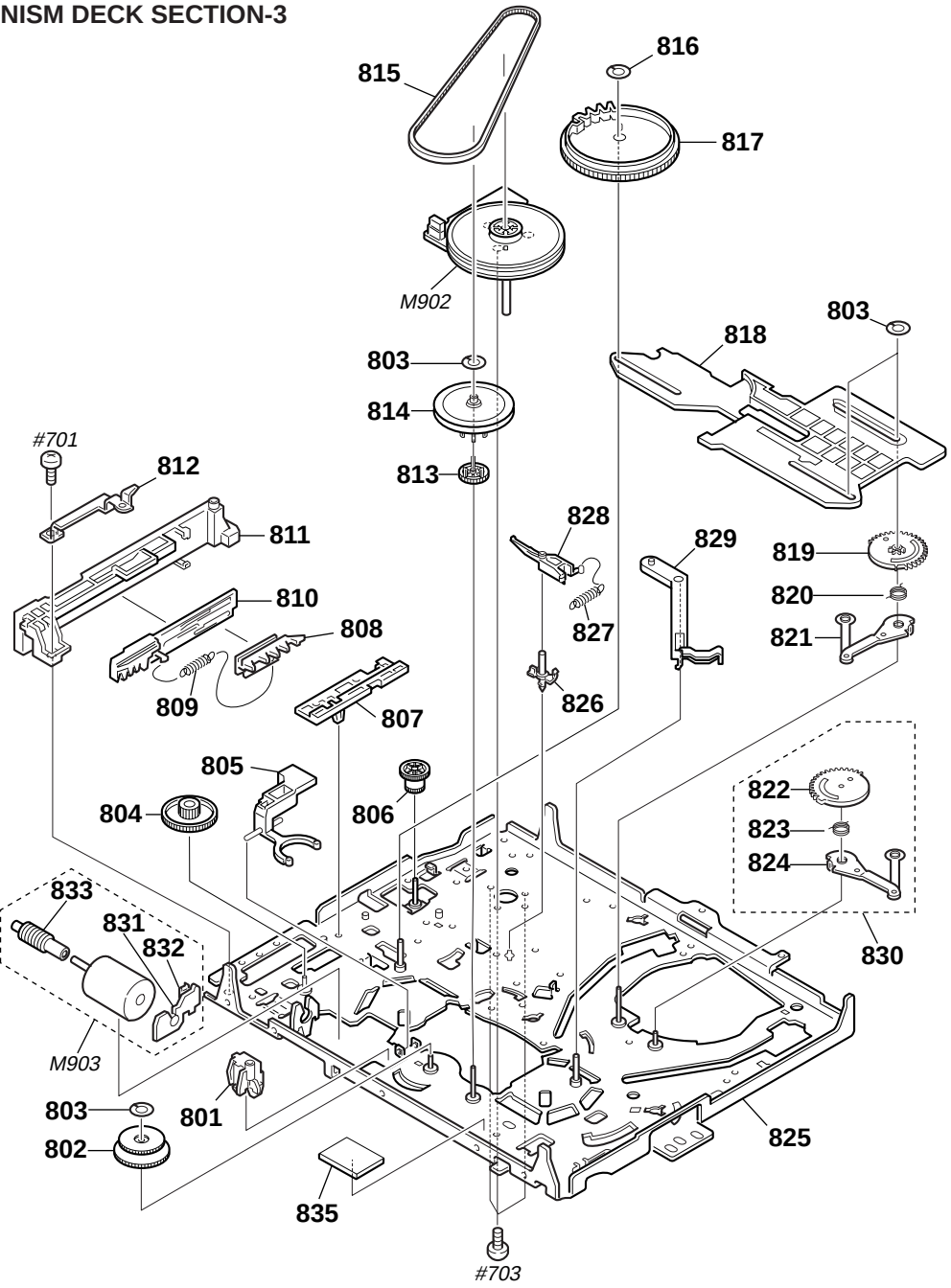
7-1-4. MECHANISM DECK SECTION-2



Ref. No.	Part No.	Description	Remarks
751	X-3947-581-1	BRAKE ASSY,MAIN(T)	
752	3-977-462-01	SPRING,EXTENTION. (MAIN BRAKE)	
753	X-3947-573-1	ARM ASSY, PENDULUM	
754	X-3947-580-2	BRAKE ASSY, MAIN(S)	
755	3-977-513-02	LEVER, REC PROOF	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)	
757	3-977-487-01	BOSS, TG1 FULCRUM	
758	X-3947-587-1	TG1 ASSY	
759	X-3947-589-1	BAND ASSY, TG1	
760	3-977-488-01	SPRING (POWER TENSION)	
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY	

Ref. No.	Part No.	Description	Remarks
762	X-3944-378-1	ROLLER ASSY, GUIDE	
763	3-965-178-01	SPRING	
764	3-969-632-04	BASE, DRUM	
765	A-6750-328-E	SHUTTLE (T) BLOCK ASSY	
766	3-977-501-01	PLATE, LUMINOUS	
767	X-3943-899-8	GROUND ASSY, SHAFT	
771	A-6746-074-G	ROLLER BLOCK ASSY, HC	
772	X-3947-255-1	ROLLER ASSY, HC	
773	3-975-724-07	ARM, HC	
776	8-839-057-51	DZH-0A7A/Z-RP (L69HF/L72HF/L79HF/L89HF/X66HF)	
776	8-839-059-02	DZH-0A9A/Z-RF (L49/L52/L59/X55)	

7-1-5. MECHANISM DECK SECTION-3



Ref. No.	Part No.	Description	Remarks
801	3-977-437-01	RETAINER,CAM MOTOR	
802	X-3947-584-1	ASSY, REEL DIRECT	
803	3-977-443-01	WASHER, STOPPER	
804	3-977-438-01	WORM - WHEEL	
805	3-977-506-01	ARM, LIMITTER SELECTION	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-02	PLATE, LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3947-585-1	GEAR ASSY, PULLEY	
815	3-977-510-01	BELT, RUBBER	
816	3-977-440-01	WASHER, STOPPER	
817	3-977-439-01	GEAR, CAM	
818	3-977-442-01	SLIDER	

Ref. No.	Part No.	Description	Remarks
819	3-977-455-01	GEAR, LOADING(T)	
820	3-977-456-03	SPRING, TORSION (LOAD T)	
821	X-3947-579-1	LEVER ASSY, LOADING(T)	
822	3-977-451-01	GEAR, LOADING(S)	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3947-578-1	LEVER ASSY, LOADING (S)	
825	X-3947-576-2	CHASSIS ASSY, MECHANICAL	
826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
827	3-977-467-02	SPRING, CAP BRAKE	
828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
829	3-977-489-01	ARM, TG1 DRIVING	
830	A-6759-616-A	GEAR BLOCK ASSY, LOADING (S)	
831	1-666-524-11	CA-55 BOARD	
832	1-766-723-21	CONNECTOR, BOARD TO BOAR 3P	
833	3-977-436-01	WORM	
835	3-989-917-01	SPACER (REC PROOF)	
M902	1-698-971-11	MOTOR, DC	
M903	X-3947-577-1	MOTOR ASSY, CAM	

7-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- Abbreviation
  MX : Mexican
  CS : Chilian, Bolivia, Peru
  PR : Puerto Rico
  VZ : Venezuelan
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
*	A-6794-655-A	AR-20 BOARD, COMPLETE (L52/L72HF/L89HF)			
		**********			
					(Ref.No.: 5,000 Series)
		< CAPACITOR >			
C570	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C571	1-164-346-11	CERAMIC CHIP	1uF		16V
C572	1-126-163-11	ELECT	4.7uF	20%	50V
C573	1-110-501-11	CERAMIC CHIP	0.33uF	10%	16V
C574	1-124-261-00	ELECT	10uF	20%	50V
C575	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C576	1-124-584-00	ELECT	100uF	20%	10V
C577	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C578	1-164-232-11	CERAMIC CHIP	0.01uF		50V
		< CONNECTOR >			
CN570	1-785-784-11	PIN, CONNECTOR (PC BOARD) 7P			
		< IC >			
IC570	8-759-566-07	IC LA7277M-TLM			
		< JUMPER RESISTOR >			
JR001	1-216-295-00	METAL CHIP	0	5%	1/10W
JR002	1-216-295-00	METAL CHIP	0	5%	1/10W
JR003	1-216-295-00	METAL CHIP	0	5%	1/10W
JR004	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L570	1-414-940-21	INDUCTOR	100uH		
		< RESISTOR >			
R570	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R571	1-216-295-00	METAL CHIP	0	5%	1/10W
R572	1-216-295-00	METAL CHIP	0	5%	1/10W
R573	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R574	1-216-049-00	METAL CHIP	1K	5%	1/10W
R575	1-216-065-91	RES,CHIP	4.7K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
*	A-6794-650-A	DI-70 BOARD, COMPLETE			
		**********			
					(Ref.No.: 2,000 Series)
		< CONNECTOR >			
CN901	1-506-483-21	PIN, CONNECTOR 4P			
		< SWITCH >			
S901	1-418-156-11	ENCODER, ROTARYRY (DIAL TIMER)			
*	A-6794-649-A	DS-84 BOARD, COMPLETE (EXCEPT L89HF)			
		**********			
*	A-6794-653-A	DS-84 BOARD, COMPLETE (L89HF)			
		**********			
					(Ref.No.: 3,000 Series)
		< CONNECTOR >			
CN442	1-691-064-31	HOUSING, CONNECTOR 5P (L89HF)			
		< DIODE >			
D441	8-719-056-06	DIODE SLR-342DC3F (JOG) (L89HF)			
		< JUMPER RESISTOR >			
JR441	1-216-295-00	METAL CHIP	0	5%	1/10W
JR442	1-216-295-00	METAL CHIP	0	5%	1/10W
		< RESISTOR >			
R451	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R452	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R453	1-216-013-00	METAL CHIP	33	5%	1/10W
R454	1-216-037-00	METAL CHIP	330	5%	1/10W (L89HF)
		< SWITCH >			
S441	1-762-196-21	SWITCH, TACT (FF) (L89HF)			
S442	1-762-196-21	SWITCH, TACT (PLAY) (EXCEPT L89HF)			
S443	1-762-196-21	SWITCH, TACT (STOP) (EXCEPT L89HF)			
S444	1-762-196-21	SWITCH, TACT (REW) (EXCEPT L89HF)			
S445	1-762-196-21	SWITCH, TACT (JOG) (L89HF)			
S446	1-762-196-21	SWITCH, TACT (FF) (EXCEPT L89HF)			
S447	1-762-196-21	SWITCH, TACT (REW) (L89HF)			

Ref. No.	Part No.	Description	Remarks
*	A-6794-651-A	JK-168 BOARD, COMPLETE (L49/L52/L59/X55) **********	
*	A-6794-652-A	JK-168 BOARD, COMPLETE **********	(L69HF/L72HF/L79HF/X66HF)
*	A-6794-654-A	JK-168 BOARD, COMPLETE (L89HF) **********	(Ref.No.: 4,000 Series)
		< CAPACITOR >	
	C803 1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
	C805 1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	(L69HF/L72HF/L79HF/L89HF/X66HF)
	C806 1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
		< JACK >	
	CJ801 1-774-510-11	JACK,PIN 2P (LINE-2 IN) (L49/L52/L59/X55)	
	CJ801 1-774-509-11	JACK,PIN 3P (LINE-2 IN) (L69HF/L72HF/L79HF/X66HF)	
*	CJ801 1-774-509-21	JACK,PIN 3P (LINE-2 IN) (L89HF)	
		< CONNECTOR >	
	CN801 1-506-469-11	PIN, CONNECTOR 4P (L49/L52/L59/X55)	
*	CN801 1-573-128-11	PIN, CONNECTOR 5P (L69HF/L72HF/L79HF/L89HF/X66HF)	
		< DIODE >	
	D801 8-719-067-40	DIODE STZ6.8N-T146	
	D802 8-719-067-40	DIODE STZ6.8N-T146 (L69HF/L72HF/L79HF/L89HF/X66HF)	
	D803 8-719-422-37	DIODE MA8051	
	D804 8-719-067-40	DIODE STZ6.8N-T146	
		< JUMPER RESISTOR >	
	JS801 1-216-295-00	METAL CHIP 0 5% 1/10W	(L49/L52/L59/X55)
		< RESISTOR >	
	R801 1-216-295-00	METAL CHIP 0 5% 1/10W	
	R802 1-216-295-00	METAL CHIP 0 5% 1/10W	(L69HF/L72HF/L79HF/L89HF/X66HF)
	R803 1-216-022-00	METAL CHIP 75 5% 1/10W	
*	A-6791-736-A	MA-341 BOARD, COMPLETE (L49/L59:VZ/X55) **********	
*	A-6791-737-A	MA-341 BOARD, COMPLETE **********	(L69HF/L79HF:VZ/X66HF)
*	A-6791-738-A	MA-341 BOARD, COMPLETE (L79HF:CS,PR) **********	
*	A-6791-739-A	MA-341 BOARD, COMPLETE (L59:CS,PR) **********	
*	A-6791-740-A	MA-341 BOARD, COMPLETE (L89HF:MX,VZ) **********	
*	A-6791-741-A	MA-341 BOARD, COMPLETE (L89HF:CS) **********	
*	A-6791-742-A	MA-341 BOARD, COMPLETE (L72HF) **********	
*	A-6791-743-A	MA-341 BOARD, COMPLETE (L52) **********	(Ref.No.: 1,000 Series)

Ref. No.	Part No.	Description	Remarks
	3-970-608-21	SUMITITE (B3), +BV	
	4-017-441-01	CUSHION (B)	
		< CAPACITOR >	
C101	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C102	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C103	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C104	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C105	1-128-057-11	ELECT 330uF 20%	6.3V
C106	1-124-589-11	ELECT 47uF 20%	16V
C107	1-164-346-11	CERAMIC CHIP 1uF	16V
C108	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C109	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C111	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C112	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C113	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C115	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C116	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C140	1-124-584-00	ELECT 100uF 20%	10V
C141	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C142	1-163-037-11	CERAMIC CHIP 0.022uF 10%	25V
C143	1-128-131-11	ELECT 22uF 20%	50V
C144	1-128-131-11	ELECT 22uF 20%	50V
C145	1-126-935-11	ELECT 470uF 20%	6.3V
C146	1-164-161-11	CERAMIC CHIP 0.0022uF 10%	100V
C160	1-163-809-11	CERAMIC CHIP 0.047uF 10%	25V
C161	1-163-809-11	CERAMIC CHIP 0.047uF 10%	25V
C162	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C163	1-163-809-11	CERAMIC CHIP 0.047uF 10%	25V
C164	1-163-237-11	CERAMIC CHIP 27PF 5%	50V
C165	1-163-102-00	CERAMIC CHIP 24PF 5%	50V
C166	1-163-231-11	CERAMIC CHIP 15PF 5%	50V
C167	1-163-233-11	CERAMIC CHIP 18PF 5%	50V
C168	1-124-584-00	ELECT 100uF 20%	10V
C169	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C170	1-163-007-11	CERAMIC CHIP 680PF 10%	50V
C171	1-127-737-11	DOUBLE LAYER 0.33F 0	5.5V
C172	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C173	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C176	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C201	1-104-760-11	CERAMIC CHIP 0.047uF 10%	50V
C202	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C203	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C204	1-109-982-11	CERAMIC CHIP 1uF 10%	10V
C205	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C206	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C207	1-163-241-11	CERAMIC CHIP 39PF 5%	50V
C208	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C209	1-124-589-11	ELECT 47uF 20%	16V
C210	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C211	1-163-239-11	CERAMIC CHIP 33PF 5%	50V
C213	1-163-131-00	CERAMIC CHIP 390PF 5%	50V
C214	1-163-257-11	CERAMIC CHIP 180PF 5%	50V
C215	1-163-227-11	CERAMIC CHIP 10PF 0.5PF	50V
C216	1-126-160-11	ELECT 1uF 20%	50V
C217	1-163-037-11	CERAMIC CHIP 0.022uF 10%	25V
C218	1-162-306-11	CERAMIC 0.01uF 20%	16V (L49/L59/L69HF/L79HF/X55/X66HF)
C220	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C221	1-109-982-11	CERAMIC CHIP 1uF 10%	10V

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Ref. No.	Part No.	Description			Remarks
C222	1-124-261-00	ELECT	10uF	20%	50V
C223	1-128-131-11	ELECT	22uF	20%	50V
C224	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C225	1-126-160-11	ELECT	1uF	20%	50V
C226	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C227	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C228	1-124-589-11	ELECT	47uF	20%	16V
C229	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C230	1-164-159-21	CERAMIC	0.1uF		50V
C231	1-124-589-11	ELECT	47uF	20%	16V
C232	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C233	1-124-261-00	ELECT	10uF	20%	50V
C234	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C235	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C236	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C237	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C238	1-124-589-11	ELECT	47uF	20%	16V
C239	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C240	1-124-589-11	ELECT	47uF	20%	16V
C241	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C242	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C243	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C244	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C245	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C246	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C247	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C248	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C249	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C250	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C251	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C252	1-162-306-11	CERAMIC	0.01uF	20%	16V (L52/L72HF/L89HF)
C267	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C271	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C272	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C275	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C276	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C278	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C279	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C280	1-124-584-00	ELECT	100uF	20%	10V
C281	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C282	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C283	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C284	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C285	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C286	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C301	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C303	1-126-160-11	ELECT	1uF	20%	50V
C304	1-126-160-11	ELECT	1uF	20%	50V (L49/L52/L59/X55)
C305	1-124-261-00	ELECT	10uF	20%	50V
C306	1-126-160-11	ELECT	1uF	20%	50V (L49/L52/L59/X55)
C307	1-126-966-11	ELECT	33uF	20%	16V
C308	1-126-963-11	ELECT	4.7uF	20%	50V
C309	1-126-963-11	ELECT	4.7uF	20%	50V (L49/L52/L59/X55)
C310	1-126-160-11	ELECT	1uF	20%	50V
C311	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C312	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C313	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C314	1-126-964-11	ELECT	10uF	20%	50V
C315	1-126-160-11	ELECT	1uF	20%	50V
C316	1-163-024-00	CERAMIC CHIP	0.018uF	10%	50V
C317	1-124-589-11	ELECT	47uF	20%	16V
C318	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C319	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C320	1-137-374-11	FILM	0.047uF	5%	50V
C322	1-126-963-11	ELECT	4.7uF	20%	50V
C323	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C324	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C325	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C361	1-126-964-11	ELECT	10uF	20%	50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C362	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C363	1-104-664-11	ELECT	47uF	20%	16V (L69HF/L72HF/L79HF/L89HF/X66HF)
C364	1-126-964-11	ELECT	10uF	20%	50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C365	1-126-964-11	ELECT	10uF	20%	50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C366	1-126-964-11	ELECT	10uF	20%	50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C367	1-104-664-11	ELECT	47uF	20%	16V (L69HF/L72HF/L79HF/L89HF/X66HF)
C368	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C369	1-126-964-11	ELECT	10uF	20%	50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C370	1-164-232-11	CERAMIC CHIP	0.01uF		50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C371	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V (L69HF/L72HF/L79HF/L89HF/X66HF)
C372	1-124-589-11	ELECT	47uF	20%	16V (L69HF/L72HF/L79HF/L89HF/X66HF)
C373	1-124-589-11	ELECT	47uF	20%	16V (L69HF/L72HF/L79HF/L89HF/X66HF)
C374	1-163-038-91	CERAMIC CHIP	0.1uF		25V (L69HF/L72HF/L79HF/L89HF/X66HF)
C375	1-164-232-11	CERAMIC CHIP	0.01uF		50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C376	1-126-964-11	ELECT	10uF	20%	50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C381	1-164-222-11	CERAMIC CHIP	0.22uF		25V (L69HF/L72HF/L79HF/L89HF/X66HF)
C382	1-164-222-11	CERAMIC CHIP	0.22uF		25V (L69HF/L72HF/L79HF/L89HF/X66HF)
C383	1-126-960-11	ELECT	1uF	20%	50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C384	1-126-960-11	ELECT	1uF	20%	50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C385	1-126-960-11	ELECT	1uF	20%	50V (L69HF/L72HF/L79HF/L89HF/X66HF)
C386	1-126-964-11	ELECT	10uF	20%	50V (L69HF/L72HF/L79HF/L89HF/X66HF)

Ref. No.	Part No.	Description			Remarks
C387	1-126-964-11	ELECT	10uF	20%	50V
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
C388	1-126-964-11	ELECT	10uF	20%	50V
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
C389	1-126-964-11	ELECT	10uF	20%	50V
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
C390	1-126-960-11	ELECT	1uF	20%	50V
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
C391	1-126-160-11	ELECT	1uF	20%	50V
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
C405	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C421	1-124-589-11	ELECT	47uF	20%	16V
C422	1-124-589-11	ELECT	47uF	20%	16V
C423	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C424	1-164-159-21	CERAMIC	0.1uF		50V
C427	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C500	1-163-098-00	CERAMIC CHIP	16PF	5%	50V
C501	1-163-098-00	CERAMIC CHIP	16PF	5%	50V
C502	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C503	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C504	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C505	1-162-199-31	CERAMIC	10PF	5%	50V
C507	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C508	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C509	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C510	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C511	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C512	1-124-584-00	ELECT	100uF	20%	10V
C513	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C514	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C561	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C562	1-104-664-11	ELECT	47uF	20%	16V
C563	1-126-935-11	ELECT	470uF	20%	6.3V
⚠C600	1-104-705-11	FILM	0.1uF	20%	250V
⚠C601	1-104-705-11	FILM	0.1uF	20%	250V
C602	1-119-886-51	CERAMIC	470PF	10%	250V
⚠C603	1-113-900-11	CERAMIC	470PF	10%	250V
⚠C604	1-113-900-11	CERAMIC	470PF	10%	250V
C605	1-119-882-51	ELECT(BLOCK)	120uF	20%	200V
		(L49/L52/L59:VZ/L69HF/L72HF/L79HF:VZ/L89HF:MX,VZ/X55/X66HF)			
C605	1-127-932-41	ELECT	150uF	20%	400V
		(L59:CS,PR/L79HF:CS,PR/L89HF:CS)			
C606	1-107-925-11	ELECT	1uF	20%	100V
C607	1-136-203-11	FILM	0.01uF	10%	400V
C609	1-107-974-11	CERAMIC	47PF	5%	2KV
C610	1-104-683-11	MYLAR	0.0047uF	5%	50V
C611	1-136-160-00	FILM	0.039uF	5%	50V
C612	1-126-160-11	ELECT	1uF	20%	50V
C613	1-115-739-31	ELECT	0.0015F	20%	10V
C614	1-115-789-11	ELECT	0.001F	20%	25V
C615	1-126-967-11	ELECT	47uF	20%	50V
C616	1-126-941-11	ELECT	470uF	20%	25V
C617	1-126-935-11	ELECT	470uF	20%	16V
C618	1-126-934-11	ELECT	220uF	20%	16V
C619	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C620	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C621	1-164-232-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remarks
C622	1-128-131-11	ELECT	22uF	20%	50V
C623	1-124-589-11	ELECT	47uF	20%	16V
C624	1-124-589-11	ELECT	47uF	20%	16V
C625	1-104-664-11	ELECT	47uF	20%	16V
C626	1-126-965-11	ELECT	22uF	20%	50V
C627	1-126-965-11	ELECT	22uF	20%	50V
C628	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C629	1-124-234-00	ELECT	22uF	20%	16V
C631	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C638	1-128-551-11	ELECT	22uF	20%	25V
C701	1-104-664-11	ELECT	47uF	20%	16V
C706	1-126-963-11	ELECT	4.7uF	20%	50V
C707	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C709	1-126-933-11	ELECT	100uF	20%	16V
C710	1-163-222-11	CERAMIC CHIP	5PF	0.25PF	50V
					(L49/L52/L59/X55)
C710	1-164-232-11	CERAMIC CHIP	0.01uF		50V
					(L69HF/L72HF/L79HF/L89HF/X66HF)
C712	1-126-933-11	ELECT	100uF	20%	16V
C733	1-126-960-11	ELECT	1uF	20%	50V
					(L49/L52/L59/X55)
		< JACK >			
CJ561	1-779-010-11	JACK, PIN 4P (LINE OUT/LINE-1 IN)			
					(L49/L52/L59/X55)
CJ561	1-779-011-11	JACK, PIN 6P (LINE OUT/LINE-1 IN)			
					(L69HF/L72HF/L79HF/L89HF/X66HF)
		< CONNECTOR >			
CN101	1-779-724-11	CONNECTOR, BOARD TO BOARD 5P			
CN102	1-779-723-11	CONNECTOR, BOARD TO BOARD 9P			
* CN103	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P			
CN104	1-506-469-11	PIN, CONNECTOR 4P			
CN161	1-506-468-11	PIN, CONNECTOR 3P			
CN260	1-563-585-11	CONNECTOR, FLEXIBLE 8P (L49/L52/L59/X55)			
CN260	1-766-986-11	CONNECTOR, FFC/FPC 13P			
					(L69HF/L72HF/L79HF/L89HF/X66HF)
* CN270	1-560-892-00	PIN, CONNECTOR 4P			
CN301	1-506-469-11	PIN, CONNECTOR 4P			
CN302	1-506-468-11	PIN, CONNECTOR 3P			
CN402	1-506-469-11	PIN, CONNECTOR 4P			
CN404	1-506-469-11	PIN, CONNECTOR 4P (EXCEPT L89HF)			
CN404	1-506-475-11	PIN, CONNECTOR 10P (L89HF)			
CN423	1-506-469-11	PIN, CONNECTOR 4P (L49/L52/L59/X55)			
* CN423	1-573-128-11	PIN, CONNECTOR 5P			
					(L69HF/L72HF/L79HF/L89HF/X66HF)
* CN600	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P			
		< DIODE >			
D103	8-719-048-26	DIODE GL528V1			
D109	8-719-200-82	DIODE 11ES2			
D161	8-719-200-82	DIODE 11ES2			
D162	8-719-200-82	DIODE 11ES2			
D301	8-719-911-19	DIODE 1SS119 (L49/L52/L59/X55)			
D302	8-719-911-19	DIODE 1SS119 (L49/L52/L59/X55)			
D405	8-719-056-07	DIODE SLR-342MC3F (POWER)			
D410	8-719-056-06	DIODE SLR-342DC3F (L52/L72HF/L89HF)			
D561	8-719-110-08	DIODE RD8.2ES-B2			
D600	8-719-051-93	DIODE DF06M-6031			

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
D601	8-719-054-32	DIODE ERA15-06TP3	
D602	8-719-030-25	DIODE EG01C-V0	
D604	8-719-109-59	DIODE RD2.7ES-B1	
D605	8-719-911-19	DIODE 1SS119	
D606	8-719-313-17	DIODE AU02A-V0	
D607	8-719-022-97	DIODE D2S4MF	
D608	8-719-073-18	DIODE S3L20UF34	
D609	8-719-313-17	DIODE AU02A-V0	
D610	8-719-160-64	DIODE RD16F-B1	
D611	8-719-911-19	DIODE 1SS119	
D612	8-719-109-85	DIODE RD5.1ES-B2	
D614	8-719-911-19	DIODE 1SS119	
D615	8-719-109-89	DIODE RD5.6ESB2	
D616	8-719-110-47	DIODE RD18ES-T1B	
D617	8-719-911-19	DIODE 1SS119	
D618	8-719-911-19	DIODE 1SS119	
D702	8-719-150-92	DIODE RD33EB3T	
		< TERMINAL >	
ET600	1-537-770-21	TERMINAL BOARD, GROUND	
ET601	1-537-770-21	TERMINAL BOARD, GROUND	
		< FUSE >	
⚠F600	1-533-296-11	FUSE, GLASS CYLINDRICAL (DIA.5) (L49/L52/L59:VZ/L69HF/L72HF/L79HF:VZ/L89HF:MX,VZ/X55/X66HF)	
⚠F600	1-532-388-31	FUSE (L59:CS,PR/L79HF:CS,PR/L89HF:CS)	
		< FERRITE BEAD >	
FB101	1-414-235-22	INDUCTOR CHIP 0UH	
FB601	1-410-858-21	INDUCTOR 0UH	
		< HOLDER >	
FH600	1-533-399-31	HOLDER, FUSE	
FH601	1-533-399-31	HOLDER, FUSE	
		< IC >	
IC101	8-759-481-46	IC LB1943	
IC160	8-759-560-88	IC M37760M6A111GP	
IC161	8-759-575-70	IC M24C02-WMN6T	
IC162	8-759-248-87	IC MM1256XF-BE	
IC201	8-759-581-54	IC LA71051M-MPB	
IC260	8-759-564-36	IC LA70011	
IC331	8-759-499-30	IC BA7755AF-E2	
IC360	8-759-559-36	IC TDA9605H/N1,518 (L69HF/L72HF/L79HF/L89HF/X66HF)	
IC403	8-742-042-00	HY B IC SBX1986-51	
IC420	8-759-438-82	IC uPD16311GC-AB6	
IC601	8-759-438-18	IC PQ12RD08	
IC602	8-759-321-95	IC HA17431PA-TZ	
		< JUMPER RESISTOR >	
JR045	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR046	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR047	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR048	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR100	1-216-296-00	METAL CHIP 0 5% 1/8W	

Ref. No.	Part No.	Description	Remarks
JR101	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR102	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR104	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR105	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR107	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR109	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR113	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR114	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR115	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR116	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR117	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR118	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR119	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR120	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR121	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR123	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR124	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR125	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR126	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR127	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR128	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR131	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR132	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR133	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR134	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR135	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR136	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR137	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR139	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR140	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR141	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR142	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR143	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR144	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR145	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR146	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR147	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR148	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR149	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR150	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR152	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR153	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR154	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR155	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR156	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR157	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR158	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR159	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR160	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR161	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR162	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR163	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR164	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR166	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR169	1-216-296-00	METAL CHIP 0 5% 1/8W	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
JR170	1-216-296-00	METAL CHIP	0	5%	1/8W
JR172	1-216-296-00	METAL CHIP	0	5%	1/8W
JR173	1-216-295-00	METAL CHIP	0	5%	1/10W
JR174	1-216-296-00	METAL CHIP	0	5%	1/8W
JR175	1-216-295-00	METAL CHIP	0	5%	1/10W
JR176	1-216-296-00	METAL CHIP	0	5%	1/8W
JR180	1-216-295-00	METAL CHIP	0	5%	1/10W
JR181	1-216-295-00	METAL CHIP	0	5%	1/10W
JR182	1-216-295-00	METAL CHIP	0	5%	1/10W
JR183	1-216-295-00	METAL CHIP	0	5%	1/10W
JR184	1-216-295-00	METAL CHIP	0	5%	1/10W
JR190	1-216-296-00	METAL CHIP	0	5%	1/8W
JR197	1-216-296-00	METAL CHIP	0	5%	1/8W
JR198	1-216-296-00	METAL CHIP	0	5%	1/8W
JR199	1-216-295-00	METAL CHIP	0	5%	1/10W
JR200	1-216-295-00	METAL CHIP	0	5%	1/10W
JR201	1-216-296-00	METAL CHIP	0	5%	1/8W
JR202	1-216-295-00	METAL CHIP	0	5%	1/10W
JS325	1-216-295-00	METAL CHIP	0	5%	1/10W (L49/L52/L59/X55)
JS326	1-216-295-00	METAL CHIP	0	5%	1/10W (L49/L52/L59/X55)
JS327	1-216-295-00	METAL CHIP	0	5%	1/10W (L49/L52/L59/X55)
JS364	1-216-296-00	METAL CHIP	0	5%	1/8W
JS405	1-216-295-00	METAL CHIP	0	5%	1/10W
JS407	1-216-295-00	METAL CHIP	0	5%	1/10W
JS412	1-216-295-00	METAL CHIP	0	5%	1/10W
JS413	1-216-295-00	METAL CHIP	0	5%	1/10W
JS414	1-216-295-00	METAL CHIP	0	5%	1/10W
JS612	1-216-295-00	METAL CHIP	0	5%	1/10W
JS614	1-216-295-00	METAL CHIP	0	5%	1/10W
JS615	1-216-295-00	METAL CHIP	0	5%	1/10W
JS616	1-216-296-00	METAL CHIP	0	5%	1/8W
JS617	1-216-295-00	METAL CHIP	0	5%	1/10W
JS619	1-216-295-00	METAL CHIP	0	5%	1/10W
JS620	1-216-295-00	METAL CHIP	0	5%	1/10W
JS621	1-216-295-00	METAL CHIP	0	5%	1/10W
JS623	1-216-295-00	METAL CHIP	0	5%	1/10W
JS624	1-216-295-00	METAL CHIP	0	5%	1/10W
JW193	1-217-666-11	SHORT	0.01		1/6W
		< COIL >			
L101	1-414-930-21	INDUCTOR	2.2uH		
L161	1-414-936-21	INDUCTOR	22uH		
L162	1-414-936-21	INDUCTOR	22uH		
L163	1-414-936-21	INDUCTOR	22uH		
L201	1-414-946-21	INDUCTOR	39uH		
L202	1-414-940-21	INDUCTOR	100uH		
L203	1-414-934-21	INDUCTOR	10uH		
L204	1-414-940-21	INDUCTOR	100uH		
L205	1-414-940-21	INDUCTOR	100uH		
L206	1-414-940-21	INDUCTOR	100uH		
L270	1-414-940-21	INDUCTOR	100uH		
L304	1-414-940-21	INDUCTOR	100uH		
L328	1-410-071-11	INDUCTOR	10mH		
L360	1-414-940-21	INDUCTOR	100uH (L69HF/L72HF/L79HF/L89HF/X66HF)		
L420	1-414-936-21	INDUCTOR	22uH		

Ref. No.	Part No.	Description		Remarks
L500	1-414-930-21	INDUCTOR	2.2uH	
L501	1-414-940-21	INDUCTOR	100uH	
L561	1-414-940-21	INDUCTOR	100uH	
L601	1-403-588-11	INDUCTOR	22uH	
L602	1-403-588-11	INDUCTOR	22uH	
L603	1-410-526-11	INDUCTOR	10uH	
L604	1-410-519-11	INDUCTOR	68uH	
L703	1-414-930-21	INDUCTOR	2.2uH	
L704	1-414-936-21	INDUCTOR	22uH	
		< LINE FILTER >		
⚠LF600	1-416-929-11	FILTER, LINE		
		< FLUORECENT INDICATOR >		
ND420	1-517-732-11	TUBE, FLUORESCENT INDICATOR		
		< PHOTO INTERUPTER >		
PH101	8-749-013-23	PHOTO INTERRUPTER GP3S120		
PH102	8-749-013-23	PHOTO INTERRUPTER GP3S120		
⚠PH600	8-749-010-64	PHOTO COUPLER PC123F2		
		< IC LINK >		
⚠PS101	1-532-727-11	LINK, IC	0.25A	
⚠PS600	1-532-841-21	LINK, IC		
		< TRANSISTOR >		
Q101	8-729-043-84	TRANSISTOR	PT380F3	
Q102	8-729-043-84	TRANSISTOR	PT380F3	
Q103	8-729-281-53	TRANSISTOR	2SC1815-GR	
Q201	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q202	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q203	8-729-216-21	TRANSISTOR	2SA1162-Y	
Q301	8-729-230-49	TRANSISTOR	2SC2712-YG (L49/L52/L59/X55)	
Q302	8-729-804-41	TRANSISTOR	2SB1122-S	
Q303	8-729-821-15	TRANSISTOR	2SD1620	
Q380	8-729-216-21	TRANSISTOR	2SA1162-Y (L69HF/L72HF/L79HF/L89HF/X66HF)	
Q381	8-729-230-49	TRANSISTOR	2SC2712-YG (L69HF/L72HF/L79HF/L89HF/X66HF)	
Q382	8-729-230-49	TRANSISTOR	2SC2712-YG (L69HF/L72HF/L79HF/L89HF/X66HF)	
Q401	8-729-421-22	TRANSISTOR	UN2211	
Q500	8-729-010-05	TRANSISTOR	MSB709-RT1	
Q502	8-729-216-21	TRANSISTOR	2SA1162-Y	
Q561	8-729-010-05	TRANSISTOR	MSB709-RT1	
Q601	8-729-043-47	TRANSISTOR	2SK2671	
Q602	8-729-012-31	TRANSISTOR	2SC4040-TL2-Q	
Q603	8-729-119-78	TRANSISTOR	2SC403SP-51	
Q604	8-729-010-25	TRANSISTOR	MSD601-RT1	
Q605	8-729-047-92	TRANSISTOR	2SB1398-Q(TA).S0	
Q606	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q607	8-729-140-98	TRANSISTOR	2SD773-34	
Q608	8-729-106-68	TRANSISTOR	2SD1615A-GP	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MA-341

Ref. No.	Part No.	Description			Remarks
		< RESISTOR >			
R101	1-249-413-11	CARBON	470	5%	1/4W F
R102	1-216-089-00	METAL CHIP	47K	5%	1/10W
R103	1-249-437-11	CARBON	47K	5%	1/4W
R104	1-216-081-00	METAL CHIP	22K	5%	1/10W
R105	1-247-863-91	CARBON	22K	5%	1/4W
R106	1-249-400-11	CARBON	39	5%	1/4W F
R107	1-249-400-11	CARBON	39	5%	1/4W F
R109	1-216-089-00	METAL CHIP	47K	5%	1/10W
R110	1-216-089-00	METAL CHIP	47K	5%	1/10W
R111	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R112	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R115	1-216-089-00	METAL CHIP	47K	5%	1/10W
R116	1-216-089-00	METAL CHIP	47K	5%	1/10W
R117	1-216-041-00	METAL CHIP	470	5%	1/10W
R118	1-216-089-00	METAL CHIP	47K	5%	1/10W
R119	1-216-077-00	METAL CHIP	15K	5%	1/10W
R120	1-249-417-11	CARBON	1K	5%	1/4W F
R121	1-216-041-00	METAL CHIP	470	5%	1/10W
R142	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R143	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R159	1-216-097-91	RES,CHIP	100K	5%	1/10W
R160	1-216-049-00	METAL CHIP	1K	5%	1/10W
R161	1-216-073-00	METAL CHIP	10K	5%	1/10W
R162	1-249-419-11	CARBON	1.5K	5%	1/4W F (L49/L52/L59/X55)
R162	1-249-426-11	CARBON	5.6K	5%	1/4W (L69HF/L72HF/L79HF/X66HF)
R162	1-249-428-11	CARBON	8.2K	5%	1/4W F (L89HF)
R163	1-216-049-00	METAL CHIP	1K	5%	1/10W
R164	1-216-089-00	METAL CHIP	47K	5%	1/10W
R165	1-216-089-00	METAL CHIP	47K	5%	1/10W
R166	1-216-073-00	METAL CHIP	10K	5%	1/10W
R167	1-249-431-11	CARBON	15K	5%	1/4W
R168	1-216-073-00	METAL CHIP	10K	5%	1/10W
R169	1-216-073-00	METAL CHIP	10K	5%	1/10W
R170	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R171	1-216-089-00	METAL CHIP	47K	5%	1/10W
R172	1-216-073-00	METAL CHIP	10K	5%	1/10W
R174	1-216-039-00	METAL CHIP	390	5%	1/10W
R175	1-216-041-00	METAL CHIP	470	5%	1/10W
R176	1-216-041-00	METAL CHIP	470	5%	1/10W
R177	1-216-041-00	METAL CHIP	470	5%	1/10W
R178	1-216-105-91	RES,CHIP	220K	5%	1/10W
R179	1-216-113-00	METAL CHIP	470K	5%	1/10W
R180	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R183	1-216-295-00	METAL CHIP	0	5%	1/10W
R184	1-216-295-00	METAL CHIP	0	5%	1/10W
R185	1-216-295-00	METAL CHIP	0	5%	1/10W
R187	1-216-295-00	METAL CHIP	0	5%	1/10W
R188	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R189	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R191	1-249-417-11	CARBON	1K	5%	1/4W F
R192	1-249-417-11	CARBON	1K	5%	1/4W F
R193	1-216-295-00	METAL CHIP	0	5%	1/10W
R194	1-216-073-00	METAL CHIP	10K	5%	1/10W
R196	1-216-295-00	METAL CHIP	0	5%	1/10W
R201	1-216-037-00	METAL CHIP	330	5%	1/10W
R202	1-216-047-91	RES,CHIP	820	5%	1/10W
R203	1-216-037-00	METAL CHIP	330	5%	1/10W
R204	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R205	1-208-830-11	RES,CHIP	100K	0.50%	1/10W
R208	1-216-295-00	METAL CHIP	0	5%	1/10W
R209	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R210	1-249-419-11	CARBON	1.5K	5%	1/4W F
R211	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R212	1-216-043-91	RES,CHIP	560	5%	1/10W
R213	1-216-049-00	METAL CHIP	1K	5%	1/10W
R214	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R215	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R216	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R218	1-216-295-00	METAL CHIP	0	5%	1/10W
R219	1-216-025-91	RES,CHIP	100	5%	1/10W
R220	1-216-295-00	METAL CHIP	0	5%	1/10W
R221	1-216-295-00	METAL CHIP	0	5%	1/10W
R224	1-216-089-00	METAL CHIP	47K	5%	1/10W
R225	1-216-295-00	METAL CHIP	0	5%	1/10W
R231	1-216-089-00	METAL CHIP	47K	5%	1/10W
R232	1-216-089-00	METAL CHIP	47K	5%	1/10W
R267	1-216-295-00	METAL CHIP	0	5%	1/10W
R270	1-216-041-00	METAL CHIP	470	5%	1/10W
R271	1-216-041-00	METAL CHIP	470	5%	1/10W
R272	1-208-788-11	RES,CHIP	1.8K	0.50%	1/10W
R273	1-216-295-00	METAL CHIP	0	5%	1/10W
R274	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R276	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R277	1-216-081-00	METAL CHIP	22K	5%	1/10W
R278	1-216-081-00	METAL CHIP	22K	5%	1/10W
R279	1-216-081-00	METAL CHIP	22K	5%	1/10W
R301	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R302	1-216-093-91	RES,CHIP	68K	5%	1/10W
R303	1-216-093-91	RES,CHIP	68K	5%	1/10W (L49/L52/L59/X55)
R304	1-216-067-00	METAL CHIP	5.6K	5%	1/10W (L49/L52/L59/X55)
R305	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R306	1-216-067-00	METAL CHIP	5.6K	5%	1/10W (L49/L52/L59/X55)
R307	1-216-093-91	RES,CHIP	68K	5%	1/10W (L49/L52/L59/X55)
R308	1-216-049-00	METAL CHIP	1K	5%	1/10W (L49/L52/L59/X55)
R309	1-216-043-91	RES,CHIP	560	5%	1/10W
R310	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R311	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R312	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R313	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R314	1-216-073-00	METAL CHIP	10K	5%	1/10W
R315	1-216-035-00	METAL CHIP	270	5%	1/10W
R316	1-216-109-00	METAL CHIP	330K	5%	1/10W
R317	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R318	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R319	1-216-033-00	METAL CHIP	220	5%	1/10W
R320	1-217-671-11	METAL CHIP	1	5%	1/10W
R321	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R322	1-216-017-91	RES,CHIP	47	5%	1/10W
R323	1-216-081-00	METAL CHIP	22K	5%	1/10W
R324	1-216-031-00	METAL CHIP	180	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R325	1-216-075-00	METAL CHIP	12K	5%	1/10W
R326	1-216-079-00	METAL CHIP	18K	5%	1/10W
R327	1-216-033-00	METAL CHIP	220	5%	1/10W
R361	1-216-083-00	METAL CHIP	27K	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R362	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R363	1-208-820-11	RES,CHIP	39K	0.50%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R364	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R365	1-216-083-00	METAL CHIP	27K	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R366	1-216-041-00	METAL CHIP	470	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R368	1-216-079-00	METAL CHIP	18K	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R369	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R370	1-216-049-00	METAL CHIP	1K	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R371	1-216-049-00	METAL CHIP	1K	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R372	1-216-073-00	METAL CHIP	10K	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R373	1-216-295-00	METAL CHIP	0	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R374	1-216-295-00	METAL CHIP	0	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R375	1-216-025-91	RES,CHIP	100	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R376	1-216-025-91	RES,CHIP	100	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R377	1-216-295-00	METAL CHIP	0	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R378	1-216-295-00	METAL CHIP	0	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R380	1-216-073-00	METAL CHIP	10K	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R381	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R382	1-216-049-00	METAL CHIP	1K	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R383	1-216-049-00	METAL CHIP	1K	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R385	1-216-295-00	METAL CHIP	0	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R386	1-216-295-00	METAL CHIP	0	5%	1/10W
		(L69HF/L72HF/L79HF/L89HF/X66HF)			
R401	1-216-029-00	METAL CHIP	150	5%	1/10W
R402	1-216-089-00	METAL CHIP	47K	5%	1/10W
R409	1-216-013-00	METAL CHIP	33	5%	1/10W
R410	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R414	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R415	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R417	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R418	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R419	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R420	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R421	1-216-295-00	METAL CHIP	0	5%	1/10W
R422	1-216-049-00	METAL CHIP	1K	5%	1/10W
R423	1-216-049-00	METAL CHIP	1K	5%	1/10W
R424	1-216-049-00	METAL CHIP	1K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R425	1-216-085-00	METAL CHIP	33K	5%	1/10W
R426	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R440	1-216-075-00	METAL CHIP	12K	5%	1/10W
R441	1-216-075-00	METAL CHIP	12K	5%	1/10W
R442	1-216-077-00	METAL CHIP	15K	5%	1/10W
R445	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R447	1-216-037-00	METAL CHIP	330	5%	1/10W
R500	1-216-049-00	METAL CHIP	1K	5%	1/10W
R502	1-216-073-00	METAL CHIP	10K	5%	1/10W
R503	1-216-049-00	METAL CHIP	1K	5%	1/10W
R504	1-216-049-00	METAL CHIP	1K	5%	1/10W
R505	1-216-045-00	METAL CHIP	680	5%	1/10W
R507	1-216-041-00	METAL CHIP	470	5%	1/10W
R508	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R509	1-216-121-91	RES,CHIP	1M	5%	1/10W
R512	1-216-295-00	METAL CHIP	0	5%	1/10W
R513	1-216-041-00	METAL CHIP	470	5%	1/10W
R561	1-216-037-00	METAL CHIP	330	5%	1/10W
R562	1-249-407-11	CARBON	150	5%	1/4W F
R563	1-249-408-11	CARBON	180	5%	1/4W F
R564	1-216-021-00	METAL CHIP	68	5%	1/10W
R565	1-216-022-00	METAL CHIP	75	5%	1/10W
R601	1-249-441-11	CARBON	100K	5%	1/4W
R602	1-247-883-00	CARBON	150K	5%	1/4W
R603	1-249-439-11	CARBON	68K	5%	1/4W
R604	1-215-889-00	METAL OXIDE	330	5%	2W F
R605	1-249-411-11	CARBON	330	5%	1/4W
R606	1-249-415-11	CARBON	680	5%	1/4W F
R607	1-215-927-41	METAL OXIDE	47K	5%	3W
R608	1-249-401-11	CARBON	47	5%	1/4W F
R609	1-249-406-11	CARBON	120	5%	1/4W F
R610	1-208-789-11	RES,CHIP	2K	0.50%	1/10W
R611	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W
R613	1-260-091-11	CARBON	220	5%	1/2W
⚠R614	1-219-153-11	FUSIBLE	10	5%	1/4W F
R615	1-249-417-11	CARBON	1K	5%	1/4W F
R616	1-247-815-91	CARBON	220	5%	1/4W
R617	1-249-417-11	CARBON	1K	5%	1/4W F
R618	1-260-091-11	CARBON	220	5%	1/2W
R619	1-249-413-11	CARBON	470	5%	1/4W F
R620	1-249-413-11	CARBON	470	5%	1/4W F
R623	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R624	1-216-430-11	METAL OXIDE	390	5%	1W F
R625	1-249-429-11	CARBON	10K	5%	1/4W
⚠R626	1-260-364-11	CARBON	1M	5%	1/2W
R627	1-249-441-11	CARBON	100K	5%	1/4W
R628	1-216-093-91	RES,CHIP	68K	5%	1/10W
R629	1-216-341-11	METAL OXIDE	0.22	5%	1W F
R630	1-216-049-00	METAL CHIP	1K	5%	1/10W
R633	1-216-047-91	RES,CHIP	820	5%	1/10W
R634	1-216-073-00	METAL CHIP	10K	5%	1/10W
R635	1-216-017-91	RES,CHIP	47	5%	1/10W
R636	1-216-047-91	RES,CHIP	820	5%	1/10W
R637	1-247-815-91	CARBON	220	5%	1/4W
⚠R642	1-215-907-11	METAL OXIDE	22	5%	3W F

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description				Remarks
R643	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R645	1-260-073-11	CARBON	5.6	5%	1/2W	
R646	1-260-073-11	CARBON	5.6	5%	1/2W	
R647	1-215-857-11	METAL OXIDE	10	5%	1W	F
R701	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R702	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R703	1-216-039-00	METAL CHIP	390	5%	1/10W	
R704	1-216-043-91	RES,CHIP	560	5%	1/10W	
⚠R705	1-240-307-81	FUSIBLE	560	5%	1/4W	
R706	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R707	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	(L69HF/L72HF/L79HF/L89HF/X66HF)
R709	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R710	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R711	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R712	1-216-295-00	METAL CHIP	0	5%	1/10W	
R713	1-216-295-00	METAL CHIP	0	5%	1/10W	
R731	1-216-049-00	METAL CHIP	1K	5%	1/10W	(L69HF/L72HF/L79HF/L89HF/X66HF)
R732	1-216-049-00	METAL CHIP	1K	5%	1/10W	(L69HF/L72HF/L79HF/L89HF/X66HF)
R733	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	(L69HF/L72HF/L79HF/L89HF/X66HF)
R734	1-216-049-00	METAL CHIP	1K	5%	1/10W	(L69HF/L72HF/L79HF/L89HF/X66HF)
R735	1-216-049-00	METAL CHIP	1K	5%	1/10W	(L69HF/L72HF/L79HF/L89HF/X66HF)
R736	1-216-295-00	METAL CHIP	0	5%	1/10W	(L69HF/L72HF/L79HF/L89HF/X66HF)
R737	1-216-081-00	METAL CHIP	22K	5%	1/10W	(L69HF/L72HF/L79HF/L89HF/X66HF)
R738	1-216-081-00	METAL CHIP	22K	5%	1/10W	(L69HF/L72HF/L79HF/L89HF/X66HF)
		< SWITCH >				
S101	1-762-108-11	SWITCH, PUSH (1 KEY)				
S102	1-771-155-11	SWITCH, ROTARY				
S401	1-771-574-21	SWITCH, TACTILE (EJECT)				
S402	1-771-574-21	SWITCH, TACTILE (POWER)				
S404	1-771-574-21	SWITCH, TACTILE (CHANNEL–)				
S405	1-771-574-21	SWITCH, TACTILE (CHANNEL+)				
S408	1-771-574-21	SWITCH, TACTILE (EASY SET UP)				
S412	1-771-574-21	SWITCH, TACTILE (REC)				
S422	1-771-574-21	SWITCH, TACTILE (REALITY REGENERATOR)				
S423	1-771-574-21	SWITCH, TACTILE (PAUSE)				
S701	1-571-588-11	SWITCH, SLIDE (RF UNIT)				
		< TRANSFORMER >				
T301	1-433-479-11	TRANSFORMER, BIAS OSCILLATION				
⚠T600	1-431-694-11	TRANSFORMER, CONVERTER (RCC)				
		< TUNER >				
TU700	1-693-442-11	TUNER, IF (BTF-3MA412) (VHF/UHF)				(L49/L52/L59/X55)
TU701	8-598-473-10	TUNER, FSS BTF-MA431 (VHF/UHF)				(L69HF/L72HF/L79HF/L89HF/X66HF)

Ref. No.	Part No.	Description	Remarks
		< VARISTOR >	
⚠VDR600	1-801-445-31	VARISTOR TNR10V241K660 (L49/L52/L59:VZ/ L69HF/L72HF/ L79HF:VZ/L89HF:MX,VZ/X55/X66HF)	
⚠VDR600	1-801-267-31	VARISTOR TNR10V431K660 (L59:CS,PR/ L79HF:CS,PR/L89HF:CS)	
		< VIBRATOR >	
X160	1-767-857-11	VIBRATOR, CRYSTAL 14.318MHz	
X161	1-579-463-11	VIBRATOR, CRYSTAL 32.768KHz	
X201	1-577-380-11	VIBRATOR, CRYSTAL 3.579MHz	
		MISCELLANEOUS	
		**********	
⚠14	1-777-852-12	CORD, POWER (L49/L52/L59:VZ,L69HF/ L72HF/ L79HF:VZ/L89HF:MX,VZ/X55/X66HF)	
⚠14	1-782-000-13	CORD, POWER (L59:CS,PR/ L79HF:CS,PR/L89HF:CS)	
⚠14	1-782-001-13	CORD, POWER (L59:CS,PR/ L79HF:CS,PR/L89HF:CS)	
17	1-418-154-11	COMMANDER, STANDARD (RMT-V267)	(L69HF/L72HF/L79HF/L89HF/X66HF)
17	1-418-155-11	COMMANDER, STANDARD (RMT-V268)	(L49/L52/L59/X55)
19	1-762-844-21	SWITCH, ROTARY (L89HF)	
20	1-779-725-11	CONNECTOR, BOARD TO BOARD 5P	
704	1-500-144-11	HEAD, FE	
776	8-839-057-51	DZH-0A7A/Z-RP (L69HF/L72HF/L79HF/L89HF/ X66HF)	
776	8-839-059-02	DZH-0A9A/Z-RF (L49/L52/L59/X55)	
832	1-766-723-21	CONNECTOR, BOARD TO BOAR 3P	
M902	1-698-971-11	MOTOR, DC	
M903	X-3947-577-1	MOTOR ASSY, CAM	
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-569-008-21	ADAPTOR, CONVERSION 2P (CS,PR)	
	1-575-334-11	CORD, CONNECTION (L69HF/L72HF/L79HF/ L89HF/X66HF)	
	1-696-592-11	CORD, CONNECTION (NTSC)	
	3-865-427-11	MANUAL, INSTRUCTION (ENGLISH)	(L59:PR/L79HF:PR)
	3-865-427-21	MANUAL, INSTRUCTION (SPANISH)	
	3-961-581-01	SHEET, PROTECTION	
*	3-987-457-02	SPACER	
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-648-79	SCREW +BVTP 3 × 12 TYPE2 IT-3	
#2	7-685-646-79	SCREW +BVTP 3 × 8 TYPE2 IT-3	
#701	7-685-646-79	SCREW +BVTP 3 × 8 TYPE2 IT-3	
#702	7-682-147-01	SCREW +P 3 × 6	
#703	7-685-133-19	SCREW (DIA. 2.6) (IT3B)	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-921-710-11

Sony Corporation
Home A&V Products Company

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